THE RAILWAY GAZETTE
A Journal of Management, Engineering and Operation
INCORPORATING
Railway Engineer · TRANSPORT · The Railway News
The Railway Times · Herapath's Railway Journal · RAILWAY RECORD.
RAILWAYS ILLUSTRATED · ESTABLISHED 1835 · The Railway Official Gazette

PUBLISHED EVERY FRIDAY
AT
33, TOTHILL STREET WESTMINSTER, LONDON, S.W.1

Telegraphic Address: "TRAZETTE PARL., LONDON
Telephone No.: WHITEHALL 9233 (12 lines)

Annual subscription payable in advance and postage free
British Isles and Abroad .....£2 5s. 0d.
Single Copies .....One Shilling
Registered at the General Post Office, London, as a Newspaper

VOL. 89 No. 8 FRIDAY, AUGUST 20, 1948

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An index to the eighty-eighth volume of THE RAILWAY GAZETTE *covering the issues from January 2 to June 25, 1948, has been prepared, and is now available free of charge on application to the publisher.*

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THE RAILWAY GAZETTE
33, TOTHILL STREET, WESTMINSTER, S.W.1.

Railway and Engineering Wage Claims

DURING the past week two major wage claims affecting the railway industry have achieved prominence. The Executive Committee of the National Union of Railwaymen has announced that it has decided to proceed with a claim for a 12s. 6d. a week flat-rate advance for its members. Last year the railway unions made a claim for an increase of £1 a week and after a court of inquiry had recommended an award of 7s. 6d., that sum was accepted, together with certain changes in grading and differentials. So far this claim is confined to the National Union of Railwaymen, but the executives of the Associated Society of Locomotive Engineers & Firemen and the Railway Clerks' Association are likely to lodge similar demands. In that event the number of workers involved will be over 600,000. This week the court of inquiry into the claims of the engineering unions for an increase of 13s. a week in the wages of about 2,500,000 engineers held meetings under the chairmanship of Sir John Forster, K.C., and it is expected that its report to the Minister of Labour will be submitted very shortly. The normal procedure is that the report must be laid before Parliament, but the Industrial Courts Act enables the Minister to publish parts of a report before submission to Parliament. In view of the desire by all the parties for an early settlement, it is possible that this course will be adopted.

* * * *

Walter Kennedy Whigham

Mr. W. K. Whigham, whose death is recorded on another page, was the last Deputy-Chairman of the London & North Eastern Railway Company. Sprung from a Scottish family whose scions learned to play golf on the Prestwick links, Mr. Whigham early in life was immersed in City affairs. By profession he was concerned with banking and investment trusts, and was for many years a member of the Court of Directors of the Bank of England. His intimate knowledge of finance led in 1920 to his appointment as a director of the North Eastern Railway Company. In the board room at York he took the place of the first Lord Cunliffe as financial adviser, and bore the brunt of negotiating the terms on which the 1923 amalgamation was carried through. Mr. Whigham was nominated as a Director of the new company, and, on the death of the first Lord Faringdon in 1934, he became Chairman of the Finance Committee. He rendered valuable service, and it was fitting that he should succeed the late Sir Murrough J. Wilson as Deputy-Chairman in 1946. At all times Mr. Whigham was ready to give the company and its officers the benefit of his exceptional experience. He never stood on ceremony, but had a happy manner of dealing with dry and intricate financial problems that set everyone at their ease and paved the way for decisions, at once prompt and sound. The ungrudging service which he rendered for so many years is an outstanding example of the important work performed unobtrusively by the directors of the private companies abolished by the Transport Act, 1947.

* * * *

The F.B.I. and Dividend Limitation

The Federation of British Industries has issued a statement replying to the Chancellor of the Exchequer's remarks to the press conference on July 14 on the extent to which the policy of dividend limitation was being observed. He said that three-quarters of the companies, whose results had been published during the three months since the appeal, had not increased their dividends, but remarked that, of the remaining quarter, although there might be special circumstances justifying a number of cases, he would remind them that by their refusal to co-operate they were jeopardising the whole voluntary basis of the scheme. The F.B.I. points out that this statement did less than justice to everyone concerned. A review of dividends announced between March 13 and June 12 has shown that 329 companies of a total of 1,361 increased their dividends. The review found reasonable justification for all but 59, and concluded that at 4½ per cent. the ratio of apparently unwarranted increases to total announcements was remarkably low. The F.B.I. states that the issued capital of 58 of these 59 companies amounted only to £17,400,000, which is insignificant when compared with £4,078,000,000, the total paid-up capital of public companies on the register.

Groundnuts Transport

Mr. A. J. F. Bunning, Adviser on Inland Transport for the Secretary of State for the Colonies, and formerly General Manager of the Nigerian Railway, is shortly visiting East Africa to discuss on the spot all forms of transport in all the East African Colonies, Northern and Southern Rhodesia, and Nyasaland. He has been investigating the possibilities of developing the navigation of various rivers in Africa to improve the transport of groundnuts with a view to easing the strain on the railway systems, particularly when greater quantities of groundnuts are available for export. As is shown elsewhere in this issue, in some notes on an interview with Mr. Bunning, consideration is being given to a number of projects designed to improve facilities at various African ports and make possible greater use of the inland water transport system of the African Colonies. Some consideration has been given to a chain of waterways linking up the great lakes of Africa, but Mr. Bunning emphasised that this was essentially a long-term project. A great deal of examination from both the economic and engineering aspects would be necessary.

* * * *

Overseas Railway Traffics

At August 6, Paraguay Central traffics for the first five weeks of the current financial year showed an aggregate improvement of G. 260,314, after two further weekly increases of G. 43,729 and G. 65,265. Recent unfavourable traffics on the Great Western of Brazil were followed by an increase of £2,000 in the week ended July 31, though, in the succeeding week, there was a decrease of £1,200; after these fluctuations aggregate traffics for the 31 weeks are now £13,400 above last year. The decline in Leopoldina and United of Havana traffics continued in the fortnight ended August 7, when Leopoldina fell by £21,438, to a total of £374,261 below the previous year. United of Havana are now £109,719 down on the aggregate, despite the fact that in the last financial year there was an aggregate improvement of £280,124. Though traffics on the Central Uruguay have been almost consistently unfavourable in recent weeks, gains of £2,392 and £2,495 were registered in the fortnight ended August 7, and have brought back the decline in this year's traffics to £14,485. Favourable South African traffics continued with an increase of £125,699 in the week ended July 17, and now show a total advance of £1,146,638 for the 15 weeks.

* * * *

Canadian Pacific Railway Interim Dividend

The Canadian Pacific Railway Company is again paying an interim dividend on the ordinary stock of 2 per cent., but the directors have pointed out that railway operations for the first part of the current year have contributed nothing to the payment. Continuing increases in the cost of materials and supplies and heavy advances in wages (retrospective to March 1) alone will aggregate $27,200,000 a year. This is more than the net railway earnings of the previous year, and has completely offset the increase in freight rates which became effective on April 8. That increase was the first general upward adjustment of charges since 1920 and averaged about 21 per cent., which compared with the 30 per cent. increase for which application was made. Application has now been made to the Board of Transport Commissioners for a 20 per cent. increase, including an interim increase of 15 per cent. pending final disposition by the Board.

* * * *

Calculating Performance of Refrigerator Cars

From Mr. P. Kereszty, Chief Engineer of the Hungarian State Railways, we have received a report, published elsewhere in this issue, of recent researches on the performance of refrigerator vehicles. As a result of these investigations, improvements in design have been planned for the future, and the administration is considering construction of experimental vehicles, in which the ice bunkers are gilled externally and kept completely closed to assist retention of the water-ice contents throughout a run and hence improve internal heat exchange. The internal surfaces of the ice-bunker thus will not rise above 32° F. until the whole of the ice has been exhausted. This will help to keep constant the area through which heat transference can take place, and, in consequence, the inside temperature will remain both lower and steadier. The chief aim of the investigations was to find whether the performance of a refrigerator vehicle could be predicted if the conductivities of the walls of the vehicle and of the cargo, in addition to the internal rate of heat exchange, were known. The author demonstrates that, if certain simplifying assumptions are made, such predictions are feasible, and he shows how two fundamental quantities, which he calls the basic temperature-ratio and the basic ice-consumption, enable internal temperatures, cargo temperatures and ice consumptions for other working conditions to be determined. Although not included in the article, a study of the air circulation in such vehicles has been carried out also, as a result of which the Flettner system (in which the ventilator is kept in rotation by the outside air) used at present has been found to be less efficient than natural air-circulation. These developments form an interesting parallel to experimental work by the L.M.S.R., described in our issue of March 23, 1945.

* * * *

Indian and Pakistan Pensions

Retired and serving officers of Indian and Pakistan railways will view with mixed feelings the statement recently made by the Chancellor of the Exchequer regarding their pensions, and his replies to questions on this subject. It is some consolation to learn that agreement has now been reached with the Governments of the two Dominions whereby the payments of all pensions, rupee or otherwise, of all services, now paid in this country in sterling, are no longer dependent on Dominion revenues, and, in so far as existing pension and provident fund undertakings are concerned, sterling payments will be provided. The Chancellor made it clear, however, that the Dominion Governments now took responsibility for all pensions, and that, therefore, such questions as any increase in pensions to meet the rise in the cost of living, were matters for them to decide. Moreover, Sir Stafford Cripps could only say that, in the event of the Dominions deciding to tax pensions paid out of India and Pakistan, there would be "consultation between the Governments to avoid inconvenience or hardship to the individual pensioner." Hitherto, there has been no question of any such taxation.

* * * *

Stephenson Centenary Commemorations

During the past week-end, both Newcastle-on-Tyne and Chesterfield organised local commemorations to mark the 100th anniversary of the death of George Stephenson. The former district, of course, was the scene of his struggles and early triumphs; the latter, the home of his wealth and retirement, and the place of his death and burial. As we remarked last week, the arrangements were local in their origin and characteristics, and there has been nothing in the nature of a national commemoration. Brief details are given elsewhere in this issue. Not until August 16, 1848, did *The Times* record Stephenson's death, but its remarks aptly and succinctly summarised his character, when it said: "Few men have obtained, or deserved a higher reputation. He rose from the humblest life from the elasticity of his native talent overcoming the obstacles of narrow circumstances and even confined education. In his profession he was as happy and ingenious in his discoveries as generous in imparting them to the world. In the history of railroad enterprise and movement the name of George Stephenson will live." The succeeding 100 years have confirmed in full measure the accuracy of this estimate.

* * * *

New Pacifics for East Coast Main Line

During the office of Mr. Edward Thompson as Chief Mechanical Engineer, L.N.E.R., a comprehensive scheme of locomotive standardisation was evolved for that railway under which traffic requirements were to be met by the smallest possible number of locomotive types. Although a number of existing non-standard classes was to be maintained—among them the "A4" Pacifics—an essential feature of the scheme was that 10 standard types should be constructed for the entire range of duty, and in recent years the prototypes of all but one of the standard designs has appeared on the road. Two Pacific designs were envisaged, the first for express passenger

working, to be designated "A1" class, and the second, the "A2" for heavy passenger and goods trains. After the rebuilding of the "P2" 2-8-2s as Pacifics, a considerable number of "A2" class engines has been built, and now, the first G.N.R. Pacific *Great Northern*, which was rebuilt as the prototype for the standard "A1" class, in 1945, has been followed by the first of a series of similar locomotives being built at Doncaster and Darlington Works. To promote further the interests of standardisation, the new "A1s" are very similar to the "A2" type, and cylinders, boilers, and numerous other details are interchangeable. The first of the new engines is ready for service on the East Coast main line, and we hope to make further reference to the design in a forthcoming issue.

* * * *

New 4-8-0s for the Central Argentine Railway

We publish elsewhere in this issue an illustrated description of a new design of 4-8-0 locomotive for goods traffic on the 5 ft. 6 in.-gauge Central Argentine Railway. These engines, which are provided with double-bogie tenders, are oil burners; in consequence, the firepans have been massively built to take the weight of the brick lining for the firebox. Flexible firebox stays are used in the front portion of the crown and in the breaking zones on the sides. Although not particularly large, these locomotives are thoroughly up to date in their design and equipment. The cylinders, 19 in. by 26 in. stroke, are provided with piston valves no less than 14 in. in dia., so that the engines should run remarkably freely in service. The working conditions are somewhat onerous; curves of a minimum radius of 120 m. had to be allowed for, and as a result, the tyres of the driving and intermediate coupled wheels are flangeless. The smaller proprietary fittings included in the design are interesting, as they reflect the care devoted to making the engines as convenient as possible from an operating viewpoint. Thirty-five of these locomotives have been ordered, and are being built by Robert Stephenson & Hawthorns Limited and by the North British Locomotive Co. Ltd., and several already have been shipped to Argentina.

* * * *

An Indian Railway Stores Department

WRITING in the April, 1948, issue of the *East Indian Railway Magazine*, Mr. R. G. Bosu, Controller of Stores on that railway, makes the following observations relating to his department. There are now seven stock depots on the E.I.R., including two taken over with that part of the former Bengal & Assam Railway recently absorbed in the East Indian system. Three of these depots are located in the three locomotive workshops, and three in the three carriage and wagon shops; the seventh is at Howrah, the principal Calcutta terminus, to meet demands for general stores needed for traffic operation and other departments in the eastern zone At Howrah also there is a Receipt & Inspection Branch, where delivery is taken of most of the stores procured for the railway. Purchase and procurement of stores are concentrated at the administrative headquarters of the department in Calcutta.

So that local demands can be met with the minimum of delay, the same item of stores is stocked in more than one depot, but for each item one of the depots is selected as what is known as the "main depot" for that particular item. The main depot is responsible for the recoupment of stock of that item, and for the distribution of surplus stock, which is generally stocked at the main depot. Each of the subsidiary depots usually recoups its stock through the main depot, which, in turn, places a corresponding demand on the headquarters office for recoupment. This system facilitates the disposal of surplus stock in all depots. Normally, depot stock is recouped once a year, either from surplus stock in other depots or by purchase at headquarters. If, however, a depot runs short of stock at other times, it can be recouped by placing a supplementary indent on headquarters through the main depot. In addition, large numbers of demands for non-stock items are received each year and procured by the head office.

In 1946 the largest depot maintained some 25,000 stock items and the smallest about 3,000 items; the corresponding pre-war figures were 17,000 and 4,000 respectively. The total number of items stocked in all the five depots owned by the E.I.R. in 1946 was 59,000, as against 44,000 in 1939, an increase of roughly one-third. The aggregate number of receipts and issues in all depots in 1945-46 was just under 7,000,000, and the total value of all transactions passing through depot books was over Rs. 9 crores, or £6¾ million. This figure was 84 per cent. higher than the corresponding one in 1938-39, due to inflated prices and higher consumption. The total cost of purchase of stores in 1945-46 throughout the railway as a whole was, however, Rs. 16·35 crores (over £12¼ million), or nearly double the value of depot transactions; the comparable figure for 1938-39 was only Rs. 3·45 crores (just over £2½ million). In both years the figures were approximately 20 per cent. of the totals for all Indian railways. It is significant that about one-third of the £12¼ million represented imported stores, mostly from the United Kingdom, largely in the shape of locomotives and wagons and parts. In 1945-46 the E.I.R. stores bill amounted to 3·84 pies (0·36d.) per ton-mile carried, over four times the pre-war figure; the corresponding figure for all Indian lines was 4·89 pies (0·46d.) against 1·42 pies in 1938-39.

* * * *

Belgian National Railways

PASSENGER traffic on the Belgian National Railways in 1947 showed a slight reduction compared with 1946, although goods traffic continued to expand. Civilian passengers totalled 232,100,000, as against 233,000,000 in 1946. There was a marked change in the composition of passenger traffic, in that third class passengers in 1947, totalling 215,000,000, constituted 92·6 per cent. of the total carried, compared with 91·6 per cent. in 1946 (213,500,000 passengers), a change which was to the detriment of second class traffic. Second class passengers (16,800,000) represented 7·3 per cent. of the entire passenger traffic in 1947, as against 8·3 per cent. in 1936 (19,200,000 passengers), while the number of first class passengers remained substantially unchanged at 300,000 (0·1 per cent.). The reduction in second class traffic is stated to be entirely due to road competition. Goods traffic increased from 51·1 million to 60 million *tonnes*, and the average haul, at 97·6 km., compared with 92 km. in the previous year.

Train mileage (inclusive of military trains) totalled 66·7 million kilometres in 1947 (45·9 million in respect of passenger trains, and 20·8 million in respect of goods trains), *i.e.*, an increase of more than 10 per cent. over the 1946 total of 59·1 million (of which passenger trains accounted for 40 millions).

As from January 19 this year the reduction of 10 per cent. in fares and rates imposed by the Government has been repealed, and the tariffs in force before May 20, 1946, have been restored. No general modification of fares and rates took place during 1947. The trend of working receipts is shown in the table below:—

	1946		1947	
	Million fr.	Per cent.	Million fr.	Per cent.
Civilian traffic—				
Passengers and luggage ...	2,552·9	36·4	2,683·6	32¼
Goods	4,195·4	59·9	5,301·4	64·1
Miscellaneous	256·5	3·7	281·9	3·4
Total	7,004·8	100	8,266·9	100
Military traffic	353·9		76·7	
Grand total ...	7,358·7		8,343·6	

The civilian traffic receipts for 1947 include an amount of fr. 803,400,000 paid by the State as compensation in respect of the 10 per cent. reduction (see above) enforced as from May 20, 1946. Of that figure fr. 481,300,000 was for the period May 20 to December 31, 1946. Civilian traffic receipts in 1947, as shown above, showed an increase of nearly 18 per cent. above the level attained in 1946. Working expenditure in 1947 was approximately 8 per cent. higher than in 1946. However, deducting a charge to the capital, renewals and reconstruction account, the actual expenditure totalled fr. 9,074·6 million, as compared with fr. 8,351·9 million in 1946.

Reconstruction in 1947 continued more slowly than in preceding years owing to the curtailment of credits granted by the State for the reconstruction of station and other buildings. Rehabilitation in 1947 comprised the reconstruction in per-

manent form of 25 bridges and 21 signal boxes, and the restoration of 17 buildings. Heavy repairs were completed in 1947 to 45 locomotives, 255 all-metal coaches, and 1,900 goods wagons. At the beginning of 1948, the following structures were still awaiting reconstruction or repairs: 240 bridges (including 200 overbridges, of which 27 interrupt traffic on the lines concerned), 173 temporary bridges, 176 buildings, and 68 signal boxes. Locomotives and rolling stock destroyed in the war or removed by the Germans and not yet recovered showed the following totals missing by the end of 1947: 467 locomotives, 34 railcars, 2,023 coaches and luggage vans, and 29,800 goods wagons (the latter total including also the units of which the whereabouts are known).

* * * *

Permanent Way

ALTHOUGH the steam locomotive provides the most popular subject of interest of those with a general enthusiasm for railways, a smaller well-informed section of the general public outside railway service is taking an increasingly detailed interest in other aspects of railway work. Beyond all question, the fundamental of the railway is the track. Motive power may alter, and, in fact, is showing a world-wide tendency in this direction, so that those whose interest is limited to the steam locomotive are finding a reducing sphere with the spread of diesel traction and electric traction. As we have said, the one fundamental unchanging feature must be the use of a specialised track. For three quarters of a century this has not changed basically in form, but modern conditions and rising costs of material and labour have combined to cause more experimental work to have been conducted during the last decade or so than at any previous time within living memory.

The main-line railways of this country spent about £21,000,000 in a normal year on maintenance of permanent way. The usual practice is to renew about 1,400 miles of track a year, and the annual requirements of permanent way material are at least 200,000 tons of rails, 4,250,000 sleepers, and 1,700,000 cubic yards of ballast. Well over 50,000 permanent way men are employed, and the work on which they are engaged is vital to the efficiency and safety of the railway. These approximate figures give some idea of the magnitude and importance of track work, but there is no doubt that the permanent way has heretofore failed to attract popular interest to an extent comparable with its importance. Possibly the publicity given recently to various forms of experiment is tending to change this. Certainly two authors and a publisher are sufficiently convinced of this to have produced an admirable popular work,* giving a well-written insight into all the principal aspects of permanent way work. The book to which we refer is well illustrated, and, although designed primarily to give an accurate idea to the general public of the work of one of the lesser known railway departments, it is also worthy of being considered by those in railway service who are not connected with the civil engineering departments, in order to give them a general insight into what the other man is doing.

* * * *

Locomotive Limits and Fits

UNLESS special requests to the contrary are made, all locomotives built in the private locomotive shops in Great Britain henceforth will be constructed to standard limits and fits, thus providing interchangeability in service allied to identical methods of manufacture, on a scale greater than anywhere else in the world. This results from the adoption by the British locomotive-building industry, under the ægis of the Locomotive Manufacturers' Association of Great Britain, of a single standard works practice in regard to limits and fits.

The benefits of this policy are not confined to the works alone, for the degree of interchangeability now offered to users is such as substantially to simplify running-shed maintenance replacements, shop overhauls, and the ordering and assembly of spare parts, particularly where a user has locomotives of two or three different makes.

The special problems found in locomotive manufacture necessitate a practice, if standardisation is to be introduced, different from that followed in other branches of engineering, and differing even from some British Standard Specifications. These problems have been met by the adoption of a practice compounded of the "hole basis" and the "shaft basis," and not exclusively one or the other; and for this new basis the L.M.A. has adopted the nomenclature of "Locomotive Basis."

In drawing up these standards, all known practices, recommendations, and specifications throughout the world were considered by the subcommittee of the L.M.A. which was charged with the work. The result has been a thoroughly practical set of limits and fits, not out of line with many existing individual requirements, and which could easily form the basis of much wider locomotive specifications, with consequent benefit to users of all makes and types of locomotives.

There are fourteen different headings in the new standard works practice, namely, regulator and boiler mountings; out-

* *The Permanent Way: Britain's Railroads in the Making.* By Horace Greenleaf and G. Tyers. London: Winchester Publications Limited, 16, Maddox Street, W.1. 10 in. × 7¼ in. 196 pp. Illustrated. Price 21s.

S=NOMINAL SIZE
C=CLEARANCE

TOLERANCES FOR COUPLING RODS
SHAFT BASIS BRITISH SYSTEM (INCH UNITS)

NOTE: FOR TOLERANCES APPLICABLE TO ADJUSTABLE BRASSES SEE CONNECTING ROD SHEET

CENTRES COUPLING ROD	BUSH AND HOLE	LENGTH BUSH	FLOATING BUSH	KNUCKLE JOINT BUSH	KNUCKLE PIN	JAW AND EYE	ROD SECTION
ALL RODS SOLID EYES OR FLOATING BUSHES LEADING ROD INTERMEDIATE ROD LEADING TO TRAILING ROD A=CR. TO CR. FOR CRANK PINS P=CR. KNUCKLE TO CR. BUSH HOLE FOR CRANK PIN Q=CR. TO CR. OF KNUCKLES R=CR. JAW FOR KNUCKLE TO CR. BUSH HOLE FOR CRANK PIN	B=DIA. BUSH HOLE IN RODS AND KNUCKLES D=O. DIA. BUSH E*=I. DIA. BEFORE PRESSING E_1=I. DIA. AFTER PRESSING	F=LENGTH OF BUSH AND THICKNESS OF FLANGE G=OVERALL LENGTH OF BUSH	E*=I. DIA. FIXED BUSH BEFORE PRESSING E_1=I. DIA. FIXED BUSH AFTER PRESSING H=I. DIA. FLOATING BUSH J=O. DIA. FLOATING BUSH F=LENGTH OF FLOATING BUSH AND THICKNESS OF COLLAR FIXED AND FLOATING BUSH G=OVERALL LGTH OF FL'TING BUSH K=LENGTH OF FIXED BUSH L=OVERALL LENGTH OF FIXED BUSH	J=LENGTH OF BUSH M*=I. DIA. BEFORE PRESSING M_1=I. DIA. AFTER PRESSING	J=DIA. PIN BEARING IN BUSH	J=BREADTH OF EYE N=WIDTH BETWEEN JAWS	J=WIDTH OF ROD O=WIDTH AND DEPTH OF ROD SECTION AND THICKNESS OF FLANGE AND WEB

NOTE: S FOR FEMALE PART = S FOR MALE PART IN ALL CASES WHERE APPLICABLE

S	A	B	D	I D in B	E*	E_2	F	G	H	J	C J in E_2	K	L	M*	M_2	C J in M_2	N	C J in N	O	P	Q	R
1·5 to 2·09														+·007 +·005								
2·1 to 2·79														+·007 +·005								
2·8 to 3·59			+·005 +·004	·002 to ·005	+·017 +·014									+·007 +·005								
3·6 to 4·49			+·006 +·005	·003 to ·006	+·017 +·014									+·007 +·005								
4·5 to 5·49			+·006 +·005	·003 to ·006	+·018 +·015									+·008 +·006								
5·5 to 6·59			+·007 +·006	·004 to ·007	+·018 +·015																	
6·6 to 7·79			+·007 +·006	·004 to ·007	+·018 +·015																	
7·8 to 9·09			+·008 +·007	·005 to ·008	+·018 +·015																	
9·1 to 10·49			+·008 +·007	·005 to ·008	+·019 +·016																	
10·5 to 11·99			+·009 +·008	·006 to ·009																		
All sizes	+·003 −·003	+·002 ·000				+·015 +·012	−·030 −·035	−·060 −·070	+·010 +·006	·000 −·002	·012 to ·017	−·002 −·005	−·032 −·040		+·005 +·003	·003 to ·007	+·035 +·030	·030 to ·037	+·020 +·000	+·001 −·001	+·005 −·005	+·002 −·002

* NOTE.—These tolerances to be used only when bushes are not re-bored after pressing into rods
NOTE.—In the case of fireboxes between wheels and between frames it is recommended that appropriate expansion allowance be made on the frames and the rods made standard

side cylinders, steam chests and covers; inside cylinders, steam chests and covers; crossheads and slidebars; piston and rod, piston valve and spindle, and valve crosshead; Walschaerts motion details; Stephenson's motion details; connecting rods; coupling rods; wheels, axles and crankpins; axleboxes and guides; brake and spring gear; forms and dimensions of rivets; mild-steel sections and bars.

In drawing up detailed instructions for the manufacture and machining of parts under these headings, all dimensions have been considered as standard, and the necessary machining limits have been given in such a form as to produce the correct fits, and thus take care of working clearances. On the drawings all tolerances are shown by a high dimension and a low dimension.

The methods of instruction in regard to the permissible tolerances are exemplified in the accompanying illustration and table referring to coupling rods, which are based on one of the charts in the L.M.A. book "Limits and Fits for Use in Locomotive Work." For all lengths of rod, the centre to centre distance must be maintained within ±0·003 in., while the shorter distances from the crankpins to the knuckle pins must be within ±0.001 in.

The method of taking care of wearing clearance can be referred to the fit of the coupling-rod joint pin in its bush. The dia. of the pin, J (see table), may be dead nominal size, or up to −0·002 in. below; whereas the final inside dia. of the bush, M2, may be 3 to 5 thousandths above the nominal. The tightest possible fit thus is 3 thousandths of an inch, and the slackest fit 7 thousandths. This is summarised in the clearance column J in M2. Opposite to clearance are the points where there are interference fits, for example, the pressing of the bushes into the rod ends. Though the stipulated tolerance for the dia. of the hole in the rod end is the same for all sizes, the permissible tolerance for the outside dia. of the bush is varied according to the dia., as indicated in column D. For a nominal external dia. of bush of, say, 7 in., the values are between 6 and 7 thousandths over-size. As the tolerance for the corresponding hole in the rod is dead size to 2 thousandths big, the range of interference fits—that is, the amount by which the bush may be larger than the hole into which it is to be pressed—is 0·004 to 0·007 in., as shown in the I column marked D in B. Tolerances for parts where no clearances are involved generally have dead size as a minimum and +0·02 in. as a maximum, as indicated for the section of the rod.

Similar procedure has been adopted throughout the locomotive chassis and machinery, and in some instances needs particular care in its application and interpretation. For example, slidebar clearances at the front end are to be measured when cold, and are then less than the back end tolerances, though equal when the engine is warmed up. Again, in the lateral clearances of an axlebox in the horns, the figures which are given in the appropriate L.M.A. chart are the manufacturing tolerances, which have to be added to the nominal clearance.

There is one important exception in the provisions, namely, driving and fitted bolts. At first sight it might be thought that here, if anywhere, was the certain case for the adoption of uniform standards. However, the surface finish of both the bolt and its hole plays such a vital part in fixing any interference fit, that the L.M.A. subcommittee felt that recommendations as to manufacturing tolerances were impracticable.

It is hoped that the L.M.A. standards may be adopted generally, and that customers of British locomotive manufacturers, both at home and overseas, may find the L.M.A. publication a useful contribution to the resolving of standardisation problems. The L.M.A. has in preparation a more comprehensive handbook, which will include the Limits and Fits publication, and which will contain a detailed vocabulary of locomotive terms in five languages.

CHIEF OFFICERS OF A BRITISH RAILWAY PRIOR TO GROUPING.—In the editorial article entitled "Superintendent of the Line" in last week's issue of *The Railway Gazette* the Chief Accountant was inadvertently omitted from the chief officers of a British railway. The Chief Accountant was one of the four officers, namely, General Manager, Secretary, Chief Accountant, and Solicitor, who were regularly required by the Directors to attend at their Board Meetings; at any rate this was the practice with the Great Western Railway Company.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

Train Service Deficiencies

The Railway Executive,
British Railways,
222, Marylebone Road,
London, N.W.1. August 16

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—With reference to the letter from Mr. Gilbert Dalton, published in your issue of July 23, arrangements have now been made, commencing with the introduction of the winter timetable on September 27, for the 12.5 p.m. Woodford to Banbury to be retimed to leave at 12.30 p.m. and arrive Banbury at 12.48 p.m.

From the same date the Western Region propose to provide a daily service at 1.40 p.m. from Banbury to Oxford.

Yours faithfully,

D. S. M. BARRIE,
Public Relations Officer

Flashing Light Signals

149, New Bond Street,
London, W.1. August 8

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—I have read with interest Mr. Martin's letter under the heading of "The Distant Signal" in your issue of August 6 about "flashing lights" at distant signals in Denmark, and think that in this connection the following notes of an experimental German installation, using "flashing light" at home signals, may be relevant to the subject.

I obtained information, when serving in B.A.O.R., of trial installations on two lines (Berlin-Hamburg and Sommerfeld-Breslau), where a new type of signal had been used during the war.

The two usual "stop" and "line clear" aspects were given by the semaphore arm in its horizontal and upper quadrant positions respectively, but for the "line clear for reduced speed and/or diverging route" indication the arm was lowered through 45 deg. in the lower quadrant, and at night—and this was stressed as the most important point—a yellow light flashing approximately 55 times per sec. (to avoid confusion with the red light of the "stop" aspect) was shown. The main reason for using this kind of signal was stated to be ". . . a number of accidents which had occurred through false indications by multi-armed signals at night, caused by smoke or fog obscuring the additional green lights in the "reduced speed" position. (German home signals of the semaphore type, when used for speed or route signalling, carry one or two additional arms, and at night show two or three green lights when the reduced speed or diverging route aspect is displayed.)

Yours faithfully,

W. H. R. GODWIN

The Distant Signal

"Eynesbury," St. Neots. July 20

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—In my letter a few weeks ago, I suggested that the accident would not have occurred if proper compliance were given to the original purposes of signals—Stop or Go.

To hide the present deficiency in operating the distant signal as only a "caution" signal, officialdom now wants to install automatic train control throughout the lines at enormous expense.

At the vast majority of stations, both at home and abroad, there are only two signals—the distant and home. The latter is usually erected at, or near, the forward end of the platform, where it serves the dual purpose of home and starter.

In your diagram with the Goswick accident report in the July 16 issue, you will notice that the home signal, No. 22, is *unnecessary*, as Nos. 18 and 19 should be performing the dual purpose of home and starters for their respective lines.

If the Goswick train had been stopped at the distant signal, and then allowed to run on at low speed to signals 18 and 19—with the signalman also showing a red or caution flag (still farther on)—the accident would have been avoided. A P.W. flagman should also have been standing at the point of derailment.

The R.C.H. claims that the retarding of clearance at stop signals could not be universally (? England) applied without detriment to the operation of the railways, having regard to the working of heavy freight trains and the incidence of gradients. But they overlook the fact that, although in other countries the distant is a "stop" signal, the average speed of trains—passenger and goods—is twice as fast as British trains! And that there is no such thing as a heavy freight train in England! Even the loads of our heaviest coal trains would hardly be considered as much more than "half-loads" in many countries, and gradients are no worse here than on railways abroad.

Another collision occurred in Scotland on July 17, which (failing particulars) was probably due to the same cause. Many others have occurred during the last 12 months, and are likely to continue as long as officialdom is allowed to continue dishing up its pedantic eyewash instead of frankly facing up to the true situation!

Yours faithfully,

E. R. B. ROBERTS

[To the best of our knowledge there was only one railway on the Continent carrying a traffic comparable with that met with in this country which, within recent years, made the first signal encountered by a driver on approaching a station an absolute stop signal, similar to the Indian outer, and that was the former Paris-Orleans Railway. We can only conclude that it was never, or extremely rarely, troubled with fogs. We cannot see how it would be possible to work in this way in Great Britain, nor how any signal, whatever its meaning, can be of much use if the driver does not see it and drives on at speed. —ED., *R.G.*]

Are Locomotive Designers Conservative?

"Strathmore," Cleveland Avenue,
Darlington. July 14

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—A frank discussion on this subject might do good if anyone took notice. It ought to help our export trade when customers begin to expect improvements.

Unfortunately, those most competent to speak are too busy getting on with their jobs, and realise that what they would like to say might give offence. The writer has spent most of his life amongst locomotives in the running and C.M.E. departments of a home railway, and whilst sometimes exasperated at the slow rate of development, now when retired and free to say what he likes about the conservatism shown, feels it is over-simplification to put all the blame on the engineer.

So far as the home railways are concerned, the concentration for the last 25 years of so many responsibilities on so few chief mechanical engineers has led to some things not receiving enough attention. Their first engineering duty is to provide and maintain locomotives, rolling stock, and other railway and dock machinery. There is nothing conservative about the equipment of the workshops, and the production methods, but a lot to be proud of.

The provision of the best possible type of locomotive should be of the first importance, but it may get a very low priority; far lower, for example, than time-wasting meetings and the never-ending masses of correspondence, with the regrettable, but not sufficiently realised result, that some of the efforts of the technical staff that may have taken weeks of work have to be put to one side for consideration at a more favourable time which never arrives, so they are filed and forgotten with their predecessors.

The writer will not attempt to give the reasons that cause the private locomotive builder to appear conservative, but would not blame the banker like one of your correspondents. Private locomotive builders, like railway companies, have wasted money on ingenious but complicated machines designed for high thermal efficiency, because in their enthusiasm they ignored the unpleasant fact that the railway engine is used and serviced by men of all types, so must be tough enough to withstand the treatment received from the worst. It would have been wiser to have used the money for the much less spectacular, but far harder, work of increasing the simplicity and efficiency of the existing type of machine.

It was unfortunate that the Paget locomotive was built with the complication of eight cylinders and three crank axles. No hard-headed engineer could be convinced that such a departure was worth while.

In adopting the principle of the fully-rotating steam admission valve, the designer was far in advance of his time. The tragedy was that he tried a type that was bound to fail. The reason for calling it a tragedy is that this failure has made others unwilling to try further. If it had been applied to a two-cylinder engine with steamchests, similar to those on Corliss engines, and someone then had known how to get rid of most of the friction and maintain steamtightness, the present-day locomotives would have been revolutionised, because it would have opened the way for other possibilities. There would have been no need for the present big passenger engines. This

is the only valve that does not violate natural laws governing steam flow, and at the same time gives accurate distribution at high speeds, so is just what we are waiting for to enable economical use to be made of present steam pressures and temperatures in simple locomotives.

About five years ago a broad-minded C.M.E. allowed the writer to read a paper before an engineering institution, mentioning some work that had been done a few years before the war, some of the remarks being outspoken. You reviewed this in your issues of April 16 and 23, 1943, and published a letter the writer sent in reply in your issue of May 7. After expressing a fear that this country would fall behind others after the war if it did not change some of its methods, the last paragraph read:—

"At the appropriate time a paper like yours would render a valuable service if you impressed this on those responsible for post-war organisation. Those unfortunate people have the writer's sympathy because he has come to the conclusion that organisations have now reached such a vast, unwieldy size that they have outgrown man's ability to control them in the present stage of his development."

As a light interlude, could not a polite Canadian express this better by saying:—

"Those Hollerith boys should not have been trusted with that canoe; they've got it up Eye-no-wot Creek and lost the paddle."

During a discussion on a paper on locomotive development nearly 18 months ago at another institution, several speakers showed that they knew what required putting right. The writer knew, but also knew there was something far more important that would have to be put right first, and after some technical suggestions ended with the following words:—

"What a difference it would make if those directing large undertakings planned a less concentrated organisation, in which experienced engineers with inventive ability were free to give of their best; he feared nationalisation would put an end to such a hope, and this failure to harness the individual's creative instinct was the primary handicap to development."

Yours truly,

T. ROBSON

Continuous Brakes for Freight Trains

The Old Manor,
Salisbury, Wilts. July 30

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—Re Mr. Parkes's query in the July 30 issue on the fitting of continuous brakes on freight trains, the same point has often occurred to me.

Rumour is proverbially a lying jade, but I have it on presumably good authority that a train so fitted would take longer to break up on arrival, and also to make up. After coupling up, an appreciable time would be required to create the necessary vacuum (or its equivalent).

It would seem that traffic could be divided into two classes:—

(*a*) Where there is a long haul, with the marshalling of the train remaining unaltered, this time (and perhaps more) might be recovered.

(*b*) If, however, vehicles are continually being added to or withdrawn from any part of the train, the extra loss of time might be considerable, with little chance of recovering it.

There is also the effect of jars during shunting.

I have no experience in this branch of railway work and so look forward to such correspondence as there may be.

Yours faithfully,

COURTENAY BARRY

13, Highland Avenue, Hanwell,
London, W.7. August 5

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—In your issue of July 30 a correspondent raised the question of continuous brakes on goods trains. As a military railwayman in Germany I had a year's experience of marshalling fitted wagons.

At one yard in the Ruhr we had four humps working night and day. Wagons had full Westinghouse gear, but no side brakes, and were checked by means of "sabots" placed on the rail. Hydraulic retarders were installed at the foot of the humps, but the additional use of "sabots" was indispensable.

In November, 1945, with the yard in a very bad state, we reached a figure of 10 derailments per 24 hours. Roughly half of these were due either to the wagons jumping the "sabots" or to the heavy collisions between wagons when "sabots" glided too freely on wet rails. There was no control such as we know with side brakes.

Delays to the yard working were incessant, as the road was out of use until the wagon was rerailed, quite apart from any consideration of damage; coal-loaded wagons with end-doors were especially susceptible to the frequent impacts. Furthermore, the screw shackles had all to be coupled by hand without the use of poles.

The yard handling of a wagon is at least as important as its running, and from a shunter's point of view there is no case for replacing side brakes with continuous brakes. As to the possibility of successfully combining the two types, I cannot pass an opinion.

Yours faithfully,

J. D. M. PARKER,
Special Trainee, Western Region, British Railways

Superintendent of the Line

Frognal, London, N.W.3. August 13

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—Regarding the articles in your August 13 issue, long-standing custom made the title "Superintendent" appropriate for officers who carried out movements and "Manager" the designation for officers who had commercial duties and communicated with the public. So the L.N.E.R. had Operating, Locomotive Running, and Marine Superintendents on the one side, and Goods, Passenger, Mineral, and Continental Traffic Managers on the other. Evidently the intention of the Railway Executive is to bring the Goods, Passenger, and Mineral Managers' functions under one regional officer styled Commercial Superintendent.

Sir George S. Gibb's reorganisation of 1902 on the North Eastern Railway not only took away passenger commercial work from the Superintendent, but transferred to him operating work at goods warehouses, yards, and docks (including the distribution of wagons) which had been controlled by the Goods Manager. As the North Eastern was primarily a goods and mineral carrier, as well as the largest railway dock owner in the country, the duties placed on the Superintendent outweighed the responsibilities which he shed. These changes were part of a well thought-out policy for improving the standard of performance of both operating and commercial branches of activity. Above all, wagon and train loads were to be increased. One means to that end was the installation of 20-ton wagons for mineral traffic, and of a number of wagons carrying from 15 to 30 tons of general merchandise; another was the building of powerful freight locomotives; a third was the establishment of a traffic statistics office to post the departmental people promptly about operating results.

The North Eastern Railway's "remodel" was reasonably successful and stood the test of time. The scheme went well largely because it was carried out by an able General Manager who had the gift of inspiring his assistants with his own faith in the new methods.

Equally good results are not to be expected if plans for reorganising work are imposed for the sake of uniformity on regional officers who are not convinced that the system, to which they are accustomed, can be altered with advantage.

Yours faithfully,

R. B.

The Somerset & Dorset Railway

The Railway Executive, Southern Region,
Waterloo Station, London, S.E.1. August 16

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—With reference to the review in your issue of August 6 of the book by Messrs. D. S. Barrie and C. R. Clinker entitled "The Somerset & Dorset Railway," it is mentioned that commercial supervision was transferred to the Southern Region on February 2 this year. It may be of interest to note that from January 1, 1948, the old Somerset & Dorset Railway was incorporated in the Southern Division of the Southern Region for operating purposes, and in this connection Mr. S. A. Wilson, the London Midland Region Assistant District Operating Manager at Bath, became responsible to Mr. A. Earle Edwards, the Southern Region Southern Divisional Superintendent at Southampton, from that date.

The motive power arrangements, however, are, for the time being, still under the control of the London Midland Region.

Yours faithfully,

S. W. SMART,
Superintendent of Operation

BENGAL-NAGPUR RAILWAY ASSETS.—It is announced that a second and final distribution of assets in the liquidation of the Bengal-Nagpur Railway Co. Ltd., of £5 8s. 7·5d. per £100 of capital stock, will be made on September 1. This payment, with the first distribution of 119 per cent. (paid on November 1, 1944), brings the total distribution in the liquidation of the company up to £124 8s. 7·5d. per £100 stock.

The Scrap Heap

INCENTIVE

We have endeavoured to carry on as best we can under a Government which continues unabated in its hostility to private enterprise, and in its belief, contrary to the teachings of all history, that man in general has any interest in work when that work is divorced from the incentive of personal gain.—*Mr. Michael Dewar at the annual meeting of British Timken Limited.*

* * *

ONE WAY OF TIPPING

Panting, the porter ran alongside the moving train to give a passenger a ticket he had been asked to get for him.

"Here you are, sir," he gasped, "it's six and tuppence. You gave me six shillings."

"Thanks," replied the passenger, as the train gathered speed. "I'm much obliged. Keep the tuppence for yourself."—*From "An Editorial Diary" in "The Glasgow Herald."*

* * *

BY THE PEOPLE—FOR THE PEOPLE

A man was fined £5 at Chertsey on August 11, for pulling the communication cord of a Waterloo-Reading train, as it drew out of Virginia Water Station. He was said to have explained that he objected to the connection of trains at Virginia Water and "Now that the railways are publicly owned it is up to them to cater for the passengers." "It is preposterous if a man thinks he can run the trains himself now the railways are publicly owned," said a solicitor for the Railway Executive.—*From the "Evening Standard."*

Going Down

The Oni of Ife, spiritual head of the Yoruba State of Nigeria, with Mr. Alex J. Webb, Superintendent (Outdoor) Railways, London Transport Executive, enjoys a tour of London's Underground

100 YEARS AGO

From THE RAILWAY TIMES, *Aug.* 12, 1848

THE daily papers have been occupied during the past week, with a series of statements upon the subject of a *strike* among the engine drivers and stokers in the employ of the North-Western Railway Company.

On Wednesday, "the authorities," with a view to insure the safety of the public, issued the following instructions to the guards employed on the southern division of the line :—

"Owing to the appointment of several new enginemen, perfectly competent to the charge of engines, but unacquainted with this line of railway, the upper-guard of the *passenger trains* on the southern division will, until further orders, ride on the footplate of the engine, to assist the engine-driver and fireman in keeping a look out for the signals, to inform the driver as he approaches the new laid portions of the line, and where the regulations of the Company require the opening of the whistle, as also to make him acquainted with the different gradients as the engine enters upon them. The guards are enjoined to be watchful and attentive in the performance of this duty, and to apprize the driver the instant the signals come into sight, as also to acquaint him when within a mile of the stations, and remind him whether the train is timed to stop thereat or not. The under-guard is to ride in the rear van and to take charge of the parcels, &c., a porter being appointed to ride in the leading van of each train, to assist at the stations in giving down and taking up luggage; as also to keep a constant look out forward towards the engine, and the instant the guard upon the engine signals with his hand to have the break applied, he is to do so immediately, still keeping his eye upon the guard when to slacken it or release it altogether. The guard upon the engine is on the instant he perceives the red signal to signal the porter in the leading van, with his hand to apply the break, and by the motion of his hand let this man know when to slacken or release the break altogether."

* * *

SENSE OF PROPORTION

One or two nationalised industries appear to be in danger of losing, not only money, but their sense of humour as well.

A well-known boot manufacturer recently advertised in the national Press, illustrating a pair of hikers, in these terms:

"No queueing for tickets. No standing in the corridor. No smuts, no smoke. All strictly de luxe! And the cost of the return ticket? The price of a pair of . . ."

To the agency responsible for preparing this advertisement has come an official and aggrieved letter from British Railways. They complain that the advertisement is "knocking copy." — *"Peterborough" in "The Daily Telegraph."*

* * *

THAT TUNNEL TO FRANCE

On the reassembling of Parliament the group of 30 members who have signed the Channel Tunnel motion will press Mr. Herbert Morrison to provide an early day for its discussion. Their proposal is that the project should be reopened and a fresh approach made to France. Regular, rapid, and adequate means of physical communication between the two countries is, in their view, essential to European stability.

They point out that French and British experts recently confirmed the 1929 verdict that it is a feasible engineering project. For the first five years work would be confined to the construction of a pilot tunnel "costing no more than £1,000,000 annually." As this would require relatively little plant, material, and manpower, no undue strain would be placed on the resources of the two countries. —*From the "Western Mail & South Wales News."*

* * *

FASTING GUARDS

A hundred Bombay railway guards are fasting to draw attention to their demands for a revised pay scale—but are working so as not to embarrass the authorities or dislocate services.—*From the "News Chronicle."*

* * *

STEPHENSON MEMORIAL.—COMMITTEE.

CHAIRMAN—Alderman Thompson, Esq., M.P.

William Crawshay, Esq.	Michael Longridge, Esq.
William Rowth, Esq.	Edward F. Starbuck, Esq.
George Lenox, Esq.	Sir John J. Guest, Bart. M.P.
Henry Rowles, Esq.	Charles Perkins, Esq.
Joseph Hawkes, Esq.	Joseph Bailey, Esq., M.P.
William Fox, Esq.	Christopher Kreeft, Esq.
John Gandell, Esq.	Henry English, Esq., F.G.S.
Edwin Maw, Esq.	Thomas Bell, Esq.
—— Bagnall, Esq.	

HON. SEC.—John Hinde, Esq.

At a Meeting, held at the London Tavern, Bishopsgate-street, on the 15th February last, of the friends of GEORGE STEPHENSON, Esq., and other gentlemen interested in the present improved and rapid communication in this country,

WILLIAM THOMPSON, Esq., M.P., in the chair,

The following resolutions were proposed, and unanimously agreed to:—

That the practical application of scientific principles in the promotion of the various branches of the manufacture and commerce of this country, have been the main cause of her prosperity, and of that proud position which she has so long maintained amongst the nations of the earth.

That, amongst those eminent individuals who, within the last century, by their extraordinary genius and unwearied perseverance in the application of these principles to useful purposes, have deserved well of their country, the name of George Stephenson ought to occupy a prominent place, as one of its most distinguished contributors.

That, whilst we honour the memory of an Arkwright and a Watt; and of others, whose brilliant discoveries in machinery and the application of steam, have incalculably extended our manufacturing and commercial advantages; while we contemplate, with national pride, those stupendous specimens of art, which in various parts of the kingdom will, for ages, attest the boldness of conception, chastity of design, and solidity of construction, that characterise the works of a Rennie and a Telford, we feel it equally due to living talent to express our high admiration of the comprehensive genius of George Stephenson, and our deep sense of the obligations which his country owe to him—not alone for the exertion of the talent, the enduring zeal and patience with which he overcame difficulties by many considered insurmountable, in the progress of railway formation,—but also for his most ingenious and successful efforts in developing and perfecting the application of locomotive power in railway conveyance.

That, considering the extensive and beneficial influence which this power must have upon the general prosperity of the country, considering the new wants, and new channels of commercial enterprise and manufacturing industry which it must open, and the great stimulus which it will give to those already in existence, and more particularly, taking into consideration the great and permanent advantage it will give to the trade at large of this kingdom, this meeting is of opinion, that some public testimony ought to be shown in honour of his talents and perseverance.

That, with this view, a committee, consisting of the above members (with power to add to their numbers), be appointed to receive subscriptions, and in all other respects to carry the foregoing resolutions into effect.

That, when the Committee shall have received a sufficient amount of subscriptions, a general meeting of the Subscribers shall be convened.

That Messrs. Glyn, Halifax, and Mills, be requested to undertake the office of treasurers.

That Mr. John Hinde, having undertaken the office of honorary secretary, he be requested to continue to act in that capacity. W. THOMPSON, Chairman.

That the thanks of this Meeting be given to W. Thompson, Esq. M.P., Chairman, for his conduct in the chair.
JOHN HINDE, Hon. Sec.

LIST OF SUBSCRIPTIONS.

Alderman Thompson, Esq. M.P.	£25 0 0
George Lennox, Esq.	25 0 0
Joseph Hawkes, Esq.	25 0 0
William Fox, Esq.	20 0 0
Edwin Maw, Esq.	25 0 0
Sir J. Guest, Bart. M.P.	25 0 0
Joseph and Crawshay Bailey, Esqs.	25 0 0
H. English, Esq.	10 10 0
John Hinde, Esq.	15 0 0
Thomas Bell, Esq.	25 0 0
The Rhymney Iron Company	25 0 0
The British Iron Company	25 0 0
Proprietors of the RAILWAY TIMES	10 10 0

*** Subscriptions of any amount received by the Committee.

From THE RAILWAY GAZETTE, *July* 6, 1839

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

SOUTH AUSTRALIA

Proposed Electrification of Adelaide Suburban Lines

A report embodying proposals for the electrification of the principal suburban services has been submitted to the government. A total of 108 miles of single track, including sidings, is involved. The total cost is estimated at £3,824,000, excluding the rebuilding and electrification of the Glenelg line. The services will be operated on 1,500-volt d.c., with overhead current collection, as in Sydney and Melbourne. Extensive rearrangement of the tracks outside Adelaide terminus will be necessary. It is intended to provide a frequent service at peak hours and a half-hourly service at slack periods.

It is pointed out that in the six years 1918-1924 in which the Melbourne suburban lines were electrified, passenger journeys there increased by 63 per cent.; a similar increase in Adelaide is expected to follow electrification.

SOUTH AFRICA

Capital Expenditure on Railways

It was announced on July 6 by the Minister of Transport that future capital expenditure on the South African Railways will be given priority in accordance with the recommendations of a departmental committee.

The present programme involves a capital expenditure of £231,000,000, of which about £90,000,000 already has been spent. It includes the building of new stations in most of the big centres, the building of three great airports, the tunnelling operations near Worcester and the electrification of the main Cape line to Touws River, the building of railway hotels in Pretoria and Cape Town, and a new Ministry of Transport building in Pretoria.

The plans will be classified into those which are urgent and must be finished as soon as possible, those that can be postponed for a short time, those which can wait longer, and those which can be scrapped.

Coal Traffic

In the first five months of 1948, wagons allocated to the collieries exceeded the figures for the corresponding period of last year by 8,000 shorts, but the extra coal transported (about 157,000 tons) could not be made available for export as the Union's own requirements advanced by 488,000 tons in the same period.

An analysis of coal production for the first five months of this year reveals that coal railed from all collieries amounted to 8,361,275 tons, which exceeds the figure for the same period of last year by 157,814 tons. The allocation for locomotives rose by 177,511 tons to a total of 2,264,606 tons. The private consumption of coal, which includes power station requirements, rose by 488,188 tons to a total of 4,965,072 tons. In the face of these demands the coal railed to the ports for shipment was only 1,131,597 tons, 507,885 tons less than that transported in the corresponding period of the previous year.

Industrial expansion, the needs of power stations, domestic and railway requirements have kept the demand for coal so high that it has been impossible for some time to supply the collieries with all their requirements in spite of severe restrictions on the loading of mine bogies with commodities other than coal. The Union's own demands for coal, especially during the winter months, have made it essential to adopt special measures to ensure the most efficient use of available wagons for the transport of coal.

RHODESIA

Record Traffic Figures

Record results achieved during March included the tonnage carried (418,341); train-miles run (623,013); and road motor service mileage run (114,866). Gross ton-miles (399,242,000) and net ton-miles (183,848,000) were the best monthly figures since July and October, 1944, respectively, when better operating conditions prevailed, for during the war years the proportion of heavy long-haul traffic to the total carried was considerably greater than now.

General Election and the Railway Bill

The Southern Rhodesia parliament is to be dissolved consequent on a government defeat in a vote of confidence, and a general election will be held shortly. It was generally expected that the Railway Bill would have been presented during the session which has abruptly ended.

Rapid Repair Work

Sir Arthur Griffin, General Manager of the Rhodesia Railways, stated recently that the railways have established what is believed to be a world record in reducing the time taken to repair locomotives and wagons. The average days under repair of locomotives have been reduced from 53 in 1946 to 38; and of wagons from 36 to 6½. In May last 97·8 per cent. of wagons were in use, and 92·5 per cent. of locomotives.

Future of Beira

Negotiations are now proceeding between the Southern Rhodesia Government and the Portuguese in regard to the future of Beira and the Beira Railway. Meanwhile, urgent development work in the port is being held up, and until the port is developed it will not be able to handle the tonnages that the Rhodesia Railways have in view.

UNITED STATES

Permanent Injunction against Strike

On July 1 a decision given by Judge T. Allan Goldsborough, of the United States District Court for the District of Columbia, made permanent the injunction against the railway strike which was threatened by three unions last May (see *The Railway Gazette* of May 14). In giving his decision, the Judge said that the unions could strike under the Norris-La Guardia Act even though it would cause great inconvenience and great loss of production and distribution; but, however much right they had on their side, they could not go to the point of adopting a process which would disintegrate society itself. Such had been the situation in this case. The unions' strike notice, issued on April 29, told the men that they had the same right to refuse to perform service on a mail train as on any other train. They were told to handle and operate troop trains, hospital trains, and milk trains with the understanding that no other service was to be performed in connection therewith.

The Judge said that under these conditions it simply meant that in a few weeks, hunger would stalk the country, the whole economic and political system would be upset, political ideologies which were opposed to the democratic system would have an opportunity to ingraft themselves in the United States, and the country's influence throughout the world would be done away with and become a laughing stock.

CANADA

April Operating Revenues

The April operating revenues for the Canadian railways were greater than for any previous April. The total was $70,841,830, a 10·8 per cent. increase over the $63,913,505 earned in April last year, and exceeded only by the July, 1945, total of $70,913,046, which was an all-time record. Revenues for the first four months of the calendar year totalled $259,112,047, compared with $239,611,891 in the similar period of 1947. Operating expenses increased from $55,583,574 in April last year to $61,569,236. Expenses for the four months ended April 30 totalled $239,994,648, compared with $219,010,564 in 1947. Freight revenue for April, reflecting the 21 per cent. freight rate increase authorised early in the month, rose to a new maximum of $57,528,004, or 14·4 per cent. above the $50,264,762 earned the previous April, despite a slight decrease in the volume of freight. April passenger revenues totalled $6,098,494, or 8·2 per cent. less than the April, 1947, figure.

ITALY

Railway Reconstruction

The reconstruction of the 14·3-mile standard-gauge single-track between Viareggio, on the Leghorn-Genoa main line, and Lucca has been completed, and train services were resumed on July 11.

Electrification

The Minister of Transport announced recently that, provided lire 25,000 million (about £16,660,000) which he asked for the general improvement of the Italian railway system is granted, the electrification of the Naples-Foggia main line, the most important west-east artery south of Rome, will be taken in hand immediately. The line is 123 miles (198 km.) long and its highest altitude is 1,794 ft. (547 metres). At Foggia the line joins the east coast main line Bologna-Ancona-Bari-Brindisi, which is also earmarked for electrification between Ancona and Bari (276·9 miles) as mentioned in our August 15, 1947, issue.

FRANCE

Abyssinian Railway Report

The ordinary meeting of the Compagnie du Chemin de fer Franco-Ethiopien de Djibouti à Addis-Abéba was held in Paris on June 29, when the accounts for 1947 were adopted. Total receipts amounted to fr. 554,106,924, and expenditure was fr. 507,829,098, leaving a profit of fr. 46,277,826. Adding fr. 72,378, interest on the company's reserves, the credit balance of the profit & loss account was fr. 46,350,204. Of this amount, fr. 40 millions were set aside as a contingencies reserve. The guaranteed interest having been paid on December 15, 1947, the balance of fr. 126 a share became payable on July 12, 1948.

M. Michel-Cote was re-elected President, and M. Bloch-Lainé was appointed Administrateur. For the first time since

1939, the report showed that the results for 1947 included those for the entire line, both in French Somaliland and Abyssinia. During two months the results had been affected by a strike of workers in Abyssinia. Further, there had been a general increase in wages due to rising prices, but railway rates had remained unchanged. The operating results, however, were relatively satisfactory, due to a considerable increase in transport capacity.

Throughout the year the demand for transport had exceeded constantly the capacity of the railway. In spite of this, the company had been able to carry the major part of the Abyssinian export trade and the whole of the import trade. In ten months exports amounted to 101,000 tons, against 74,760 tons in 1946; and the imports were 57,540 tons, against 53,447 tons. Interpal traffic rose to 46,026 tons, compared with 34,459 tons last year.

The total tonnage transported in 1947 was 204,568 tons, against 162,666 in 1946. This total was 2½ times the tonnage of 1934 (77,361 tons). The number of passengers in 1947 increased to 324,937, comparing with 114,854 in 1934.

U.S.S.R.

Mail Van Shortages

The bad state of repair in which postal vans are allowed to operate on certain lines has been the subject of severe criticism by the Engineer-in-Chief of the Moscow Postal Transport Management. No fewer than 14 vans awaiting repairs had been immobilised recently at the Moscow terminus of the Moscow-Rjasan main line, it was stated. Since replacements were not available, postal vans from incoming trains have had to be attached immediately to outward-bound services without being cleaned or inspected.

Mailbags and other postal packets waiting for transport have had to be thrown into the vans in heaps during the last minutes before departure, without proper checking of destinations. As a result of this state of affairs, and particularly because of the inadequate mechanical inspection no fewer than 49 vans have had to be taken out of service while actually *en route* in recent weeks, with great inconvenience to the postal service as well as to the public.

FINLAND

Railway Building

Three lines totalling 173·8 route miles are being built. The northernmost, 62 miles long, will be an extension of the 28½-mile Kontiomäki—Hyrynsalmi line to Taivalkoski. Kontiomäki is an important junction on the main line from Oulu (west coast) to Joensuu, the northern terminus of the main line from Kouvola (on the Helsinki—Leningrad line). The second line, 80·7 miles long, is in central Finland and will connect Haapajärvi (34 miles east of Ylivieska junction on the west coast main line) in the north with Aeänekoski in the south. The third line, 31 miles long, is an extension of the Orivesi—Torkkeli branch; Orivesi is on the Helsinki—west coast main line to the north of Tampere, the second town of Finland. The 4·3-mile section from Torkkeli to Talviainen has already been opened.

The present route mileage of the Finnish railways is 2,918·7 miles, including 137·3 route miles of privately-owned railways; 498 route miles were lost in the eastern territories now incorporated in the Soviet Union. The Finnish frontier station on the Helsinki—Leningrad line is Vainikkala, 175·7 miles east of Helsinki and only about 18 miles west of Viipuri.

Fast trains operate at present on six lines only. Helsinki—Etusimola—Lappeenranta; Helsinki—Turku (Abo), across the Russian-leased Porkkala territory; Helsinki—Tampere—Oulu on the west coast route for Sweden; Tampere—Toijala in the south; Kouvola (Helsinki—Leningrad line)—Iisalmi. Thirty-four sleeping car services are operated nightly by the State Railways. The International Sleeping Car Company runs three dining car services daily. There are no first class coaches on the Finnish Railways except on the Helsinki—Turku (Abo) main line where one fast train either way connecting at Turku with the night boat from and to Stockholm conveys them; this route provides the best connection between the Finnish capital and western Europe.

CZECHOSLOVAKIA

New Main Line

A new main line is at present being built in southern Slovakia which, in conjunction with existing links, will form a shorter route between Bratislava, capital of Slovakia, and Kosice, most important town in the east of the country. The section at present in hand extends from Lucenec about 20 miles westwards to Modry Kamen. Lucenec is on the southern main line branching at Nové Znamky from the Bratislava—Budapest main line, and leading in a north-easterly direction. Between Levice (32 miles from Nové Znamky) and Lucenec, 82½ miles further east, the line describes a wide detour to the north (*via* Zvolen). The new line is to form a chord to this detour and will join the existing Bratislava main line at Levice, after having crossed at Hontlanske Tesary the north-south line Zvolen—Sahy (on the Hungarian frontier). The existing main line to the east of Lucenec runs to Plesivec, 57·8 miles from Lucenec, and there are three local lines from Plesivec to the north. A link, about 24 miles long, is to be built from Plesivec eastwards to connect at Turna and Bodvou with the existing 25½-miles line leading thence to Kosice.

The present main route between Bratislava and Kosice, 279½ miles, leads north of Bratislava to Zilina, the junction of the main line from Poland, and thence east through difficult mountain regions. The new route will be only 236 miles long.

Publications Received

The Steam Lorry, 1896-1939. By R. W. Kidner. Locomotion Papers No. 3. South Godstone, Surrey: The Oakwood Press, Tanglewood. 7¼ in. × 4¼ in. 22 pp. Illustrated. Paper covers. Price 2s. 6d.—In this little treatise, the author has amassed a considerable amount of information of great interest to those for whom the steam lorry has its own special attraction. Railway companies were substantial users in early years. There is a useful appendix listing manufacturers and their approximate period of building.

Locomotive Cyclopedia. 1947. Thirteenth Edition. New York, U.S.A.: Simmons-Boardman Publishing Corporation, 30, Church Street, New York, 7. 11¼ in. × 8¼ in. × 2¼ in. 1418 pp. Price $8.—So great is the range of locomotive engineering, that the production of a locomotive encyclopedia is almost a gargantuan task, and not only so, it is exacting on two paramount points, for the work will be of little value unless it is both systematic and exhaustive. There can be no doubt that on both these counts, this "Locomotive Cyclopedia" is highly successful, though it achieves considerably more in being a monumental tribute to contemporary American locomotive engineering. In the thirteenth edition of this work, the previous high standard is fully maintained, and as there have been many developments in locomotive design since the last edition, several important changes have been made. As a result of the considerable extension of diesel traction in switching, transfer and road service, this section of the encyclopedia has been expanded and the section on locomotive shops and engine sheds has been revised completely. Chapters have been added on the operation and maintenance of diesel locomotives and the new diesel shop facilities a number of railways recently have added. A vast amount of research and revision has been entailed in rearranging the book, and so that it should be kept to a reasonable size, little other than current practice is included.

Statistics of the Iron and Steel Industries of Overseas Countries, 1946. London: British Iron & Steel Federation, Steel House, Tothill Street, S.W.1. 9 in. × 6½ in. × 1 in. 329 pp. Paper covers. Price 15s.—This edition is the first post-war issue of a valuable year book which has been published since 1919. To preserve continuity, data for the war years have been incorporated. Details of iron and steel production and trade of the major countries of the world are included, together with most useful summary tables relating to iron ore and crude steel output. Despite the great difficulty in obtaining accurate and up-to-date figures from some countries, the work is more comprehensive than the last edition published in 1937, several countries having been included for the first time and the particulars of others expanded.

Limits and Fits for Use in Locomotive Work. The Locomotive Manufacturers' Association, 82, Victoria Street, London, S.W.1. 5 in. × 7¼ in. 15 plates.—This booklet gives in concentrated form, by means of fifteen small folding diagrams, all the essential limits and fits agreed on by the locomotive manufacturing industry in this country. It is undoubtedly of the greatest possible value to the railway workshops staffs throughout the world who are engaged in the maintenance of locomotives built by the Association's member firms. The peculiar conditions of locomotive manufacture and maintenance make it necessary to adopt standards not entirely in line with those laid down by the B.S.I. The booklet would be of great value in circumstances such as those prevailing during the second world war, when so many different works were manufacturing locomotives to a single design of 2-8-0. The production of this publication attains a high standard; the diagrams, though small, are very clear; and the only feature which has suffered in the reduction for block-making is the adjoining explanatory matter. Editorial reference is made to the booklet elsewhere in this issue.

Performance of Refrigerator Vehicles

Calculations based on research by the author affecting design of refrigerator cars

By P. Keresztÿ,

Chief Engineer, Hungarian State Railways, Budapest

LONG experience has enabled fairly exact knowledge to be obtained regarding the ice consumption and internal temperatures achieved in ice-cooled refrigerator vans, as well as the degree of cooling imparted to the load carried. But, so far, the inter-relationship of these factors has been studied comparatively little. The following notes put forward a theory of the mutual variation of the above-mentioned quantities. For this purpose, certain simplifying assumptions are made, as follow :—

(1) Inside temperatures are taken to be uniform throughout the van.

(2) Outside temperatures are assumed to be uniform.

(3) The heat capacity of the vehicle is neglected.

(4) Average values of certain varying conditions are used.

Fig. 1 shows the heat transference taking place inside an empty vehicle. If H denotes the heat transferred per unit time (in B.Th.U. per hour), and if A is the surface area of the van (in sq. ft.) and a the surface area of the ice, or water-ice mixture, or solid carbon dioxide (sq. ft.), then, with t_i and t_o denoting inside and outside temperatures (°F.) and t_z the surface temperature (°F.) of the ice, we have :—

$H_1 = UA\ (t_o - t_i)$ = heat transmission into the car ; and

$H_2 = ha\ (t_i - t_z)$ = heat absorption of the ice.

The coefficient U is the average conductivity of the material of which the body of the refrigerator van is made (B.Th.U. per sq. ft. per hr. per °F.), whilst h is the surface absorption coefficient of the ice bunker. The product UA is a characteristic function which is constant for a particular type of vehicle; likewise, the product ha may be taken as a constant which is characteristic of the internal cold-exchange. After steady conditions have been reached in the empty vehicle, $H_1 = H_2 = H$. From this and the equations already given for H_1 and H_2, two characteristic ratios can be obtained for a refrigerator vehicle, from which some very important design factors can be derived. These ratios are :—

$$\frac{t_i - t_z}{t_o - t_z} = \frac{UA}{ha + UA} = \frac{1}{1 + \frac{ha}{UA}} \quad .. \quad (1)$$

$$\frac{H}{t_o - t_z} = \frac{UA}{ha + UA} \times ha = \frac{1}{\frac{1}{ha} + \frac{1}{UA}} \quad .. \quad (2)$$

The following points emerge :—

(*a*) The less the value of ratio (1) for a given vehicle, the lower the inside temperatures which can be produced.

(*b*) The less the value of ratio (2) for a given vehicle, the lower the ice consumption.

The trend of development of refrigerator vans should be therefore in the direction of (i) lowering the factor UA (by good insulation and allowing only the smallest surface in design) ; and (ii) increasing the factor ha to obtain the lowest temperature in the vehicle. If a given vehicle has a big value for ha, and if low temperatures are not specially needed for the cargo, the factor ha can be diminished by covering the ice-bunkers or by any other simple method which impedes air circulation.

The case of a loaded car is shown by Fig. 2, in which a_l denotes the surface area of the cargo, and h_l its absorptivity; the value of the latter is about — 0·8, but may be twice that figure if its surface temperature t_l is less than t_i. In Fig. 2, the heat transmission into the vehicle and the heat absorption by the ice are represented by the same equations as those given above for Fig. 1. The exchange of heat from the cargo is given by :—

$$H_3 = h_l a_l (t_l - t_i)$$

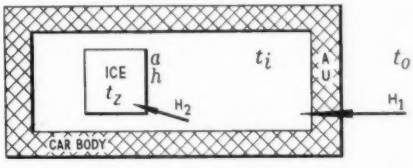


Fig. 1.—Heat transference in an empty vehicle

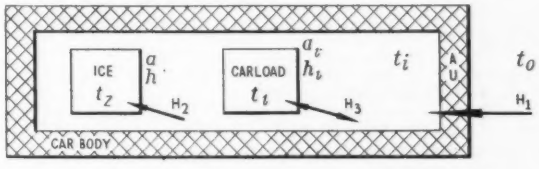


Fig. 2.—Heat transference in a loaded vehicle

where $h_l\ a_l$ is a comprehensive coefficient characterising the load, its quantity, surface, and method of stacking. After steady conditions have been reached :—

$$H_1 + H_3 = H_2 = H$$

from which calculations can be made, on the lines already indicated, of the ratio between inside temperature and ice consumption. The number of variables makes it difficult to investigate the inter-relationship of the various factors by mathematical means ; as an alternative, experiments may be carried out to arrive at values for the coefficients ha and UA for a given car. These can then be taken as constants, which can be used in assessing the performance of a refrigerator vehicle.

Actual measurements have already been made in Hungary, the temperatures inside and outside the car being recorded and the ice consumption during steady conditions being arrived at by weighing the car periodically. Ideally, this should be done in a well-insulated room where outside temperatures would remain constant. Unfortunately, no such laboratory was available to the Hungarian State Railways.

The mathematical ratios for inside temperature and for ice consumption can be derived from the formula $H_1 + H_3 = H_2 = H$, substituting the values for H_1 and H_3 already given. By this process, two cumbersome expressions are obtained, equalling respectively the basic temperature-ratio, $\frac{t_i - t_z}{t_o - t_z}$ and the basic ice consumption coefficient $\frac{H}{t_o - t_z}$ and differing only in the fact that the second expression is ha times as great as the first. We can make use of that simple relationship between these two ratios in constructing Fig. 3, in which the values for both ratios are combined in a single diagram.

Suppose, for the sake of argument, that a vehicle is loaded with cargo having a temperature exactly equal to that of the inside of the van, that is $t_l = t_i$. The load will not influence the inside temperature of the vehicle, nor the ice consumption, because no heat exchange will be effected. In this case, the ratio, $\frac{t_i - t_z}{t_o - t_z}$ gives the lowest temperature ratio obtainable for the given vehicle (except for the case in which the load cools the car).

In Fig. 3, the left-hand ordinate scales

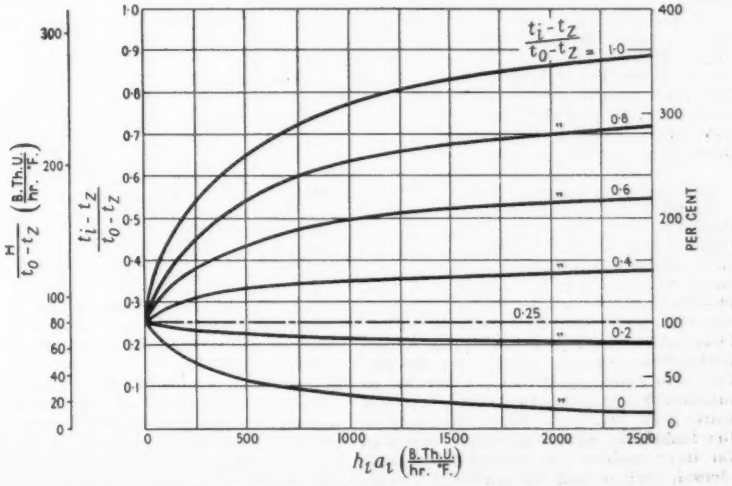


Fig. 3.—Showing variations of basic ice consumption and basic temperature ratio

show, respectively, values for the basic ice consumption, $\frac{H}{t_o - t_z}$ ranging from 0 to 320 and the basic temperature ratio, $\frac{t_i - t_z}{t_o - t_z}$ ranging from 0 to 1. The two scales of variables can be combined in a single scale (shown on the right) since numerically the basic values of the one are 320 times those of the other. The basic values are $\frac{t_i - t_z}{t_o - t_z} =$ 0·25 (100 per cent.) and $\frac{H}{t_o - t_z} = 80$ B.Th.U. per hr. per °F. (100 per cent.).

The following examples show the use of Fig. 3:—

I. $ha = 320$ B.Th.U. per hr. per °F.
UA = 106·3 B.Th.U. per hr. per °F.
$h_l a_l = 1{,}250$ B.Th.U. per hr. per °F.
$t_o = 80°$ F.
$t_z = 32°$ F. (water-ice).
$t_l = 80°$ F.

To find the inside temperature of the vehicle at the outset of steady conditions, and the ice consumption, we have $\frac{t_l - t_z}{t_o - t_z} = 1$ and the ordinate at $h_l a_l = 1{,}250$ intersecting the curve relating to this ratio at the point at which :—

$\frac{t_i - t_z}{t_o - t_z} = 0{\cdot}81$; and $\frac{H}{t_o - t_z} = 249$ B.Th.U. per hr. per °F.

Hence the inside temperature of the vehicle is given by:—

$(80 - 32)\,0{\cdot}81 + 32 = 71°$ F.

as soon as steady cooling begins. The ice consumption corresponds to:—

$(80 - 32)\,249 = 11{,}950$ B.Th.U. per hr., that is 83 lb. ice per hr.

The temperature of the cargo is lowered from its initial value, because the heat it loses is:—

$H_3 = h_l a_l\,(t_l - t_i) = 1{,}250\,(80 - 71) =$ 11,250 B.Th.U. per hr.

This lowering of the cargo temperature also reduces the inside temperature and also reduces the ice consumption.

II. With all the foregoing values, but a different cargo temperature t_l, the figure for which is now in accordance with the basic temperature ratio for the car, let us find the ice consumption for this new condition.

$\frac{t_l - t_z}{t_o - t_z} = 0{\cdot}25$ (from Fig. 3)

$t_l = 0{\cdot}25\,(80 - 32) + 32 = 44°$ F.

and the cargo temperature is not changed. From Fig. 3, ice consumption H corresponds to:—

$(80 - 32)\,80$
= 3,840 B.Th.U. per hr.
= 27 lb. per hr.

III. With all other values in example I, let the cargo temperature t_l now be taken as 32° F. ; ice consumption for this new condition is calculated as follows. Here, $\frac{t_l - t_z}{t_o - t_z} =$ 0 and using Fig. 3, at the intersection with the line, $h_l a_l = 1{,}250$ we have :—

$\frac{t_l - t_z}{t_o - t_z} = 0{\cdot}065$; and $\frac{H}{t_o - t_z} = 21$.

Hence, the inside temperature of the vehicle is given by:—

$t_i = 0{\cdot}065\,(80 - 32) + 32 = 35{\cdot}15°$ F. initially.

Ice consumption $H = (80 - 32)\,21 = 1{,}008$ B.Th.U. per hr. initially.

The cargo temperature is raised above its initial value, the amount of heat it absorbs being:—

$H_3 = 1{,}250\,(32 - 35{\cdot}15) = -3{,}938$ B.Th.U. per hr. (the negative sign indicating the absorption of heat in this case).

IV. Finally, we may consider what will happen if the outside temperature t_o varies over the range 65–95° F. the average being 80° F. as before. The resulting changes are given in the table below. It will be seen that the higher the cargo temperature, the smaller the deviations from the average values. The heat capacity of the vehicle naturally influences the fluctuations of inside temperature and hence also the ice consumption.

The foregoing investigations show that the performance of a refrigerator car can be predicted if the values of the heat conductivity and the internal rate of heat exchange are known. The figures for ice consumption, internal and outside temperatures, and cargo temperature obey definite relationships, thus:—

(1) Every refrigerator vehicle has its own most suitable temperature ratio, depending on the outside temperature (" basic temperature-ratio ").

(2) Cargo temperature, inside temperature, and ice consumption vary according to these basic ratios.

(3) By simple alterations in the internal arrangements, as by covering the ice-bunkers and thus changing the factor *ha*, the basic ratios can be altered.

(4) When the cargo temperature is higher than that corresponding to the basic temperature ratio, the ice consumption increases rapidly.

VARIATIONS IN ICE CONSUMPTION AND INSIDE TEMPERATURE CAUSED BY FLUCTUATIONS IN OUTSIDE TEMPERATURE

Example	Outside temp. t_o, °F.	$\frac{t_o - 32}{80 - 32}$ per cent.	Cargo temp. t_l, °F.	$\frac{t_l - t_z}{t_o - t_z}$	Values obtained from Fig. 3, per cent.	Inside temp. t_i, °F.	Ice consumption H, B.Th.U. per hr.	Percentage deviation from values corresponding to $t_o = 80°$ F.
1	95	131	80	0·762	254	72	12,800	+3
	80	100		1	324	70·8	12,440	—
	65	69		1·456	460	70	12,130	−3
2	95	131	44	0·191	81	44·8	4,080	+6
	80	100		0·25	100	44	3,840	—
	65	69		0·364	134	43·1	3,540	−8
3	95	131	32	0	26	36·1	1,310	+31
	80	100		0	26	35·1	998	—
	65	69		0	26	34·1	686	−31

PAPER SALVAGE RESULT.—Increased salvage during the first six months of the present year has made it possible to suspend for the time being the imports of foreign waste for which Britain has had to pay in hard currency. It is announced by the Waste Paper Recovery Association that there should be no need to resume such imports provided every household and business undertaking in the country plays its part in the salvage drive.

GEORGE STEPHENSON COTTAGE APPEAL.—In April last, Mr. H. B. Robin Rowell, President of the North East Coast Institution of Engineers & Shipbuilders, Bolbec Hall, Newcastle-on-Tyne, issued an appeal for funds to purchase the cottage at Wylam, Northumberland, where George Stephenson was born, and to present it to the National Trust for permanent preservation. Funds were required, also, to put the cottage into good repair and provide for its maintenance in years to come. We now learn from Mr. T. S. Nicol, Secretary of the Institution, that donations received so far have enabled the cottage to be purchased, and it will be formally handed over to the National Trust in due course. In the first place, the sum of £1,200 was aimed at, but it is now considered desirable to increase this target to £1,500, bearing in mind the need for adequate maintenance funds. Further donations are accordingly invited from individuals and firms.

METROPOLITAN-VICKERS GLASGOW AND BELFAST OFFICES.—Mr. T. J. Ballard has relinquished the duties of Manager of the Glasgow Office of the Metropolitan-Vickers Electrical Co. Ltd., and has been succeeded by Mr. L. Whitham. Mr. S. McCracken, who has been on the staff of the Metropolitan-Vickers Belfast sub-office since 1934, has now been appointed Assistant Manager there.

TUBULAR STEEL LIGHTING COLUMNS.—At Devonshire Park, Eastbourne, during the annual meeting of the Association of Public Lighting Engineers from September 13-17, an exhibit is being arranged by Stewarts and Lloyds Limited of 12 tubular steel lighting columns as representing the standards developed by the company to meet the recommendations of the Ministry of Transport in street lighting at mounting heights of 25 ft. for main traffic routes and between 13 ft. and 15 ft. for other routes. The columns to be erected will be without added ornamentation because many engineers consider this unnecessary on æsthetic grounds and undesirable from a utility and maintenance point of view.

CITY OF LONDON COLLEGE EVENING CLASSES.—When the next session opens at the City of London College, Moorgate, E.C.2, on September 20, classes again will be available to prepare students wishing to sit for examinations of the Institute of Transport at the Graduateship and Associateship stages. Lectures are given weekly and enrolment will take place after 5 p.m. on September 14 and 15, as well as at the same time on September 13 for old students only.

CINEMA AT GLENEAGLES HOTEL.—Another attraction has been added to the extensive list of items for the enjoyment of guests at British Railways' Gleneagles Hotel, Perthshire. The gymnasium has been converted into a cinema and the first programme included Noel Coward's " This Happy Breed," which was supported by news and interest films. It is intended to show the programme three times a week, so that all guests who wish to see it may do so; special showings of children's films also are arranged during the week.

Roof Replacement at Birmingham New Street

Demolition of overall structure and replacement with temporary roofing under ordinary traffic conditions

View of platform from London end, showing the temporary awnings that have replaced the overall roof

A TRADITIONAL architectural feature of many large railway stations which were built from the middle of the nineteenth century onwards was the arch-type overall roof, with its wide bowstring trusses, usually spanning the whole width of the platforms. Under modern conditions such roofs are not necessarily the most technically suitable, nor the most economical to maintain, but their renewal or replacement may well present features of no small engineering difficulty.

Special interest therefore attaches to the recent demolition and reconstruction scheme carried out at New Street Station, Birmingham, where, under the direction of Mr. W. K. Wallace, Chief Civil Engineer of the London Midland Region, a large arch-type wrought-iron roof was totally removed, and replaced by a more modern temporary structure, with a minimum of interference to the working of the station. This work was begun by the former L.M.S.R. in November, 1945, and the replacement by means of individual platform roofs was completed in April this year.

The Original Structure

The original roof at New Street Station, built in 1852, consisted of 36 bowstring trusses in wrought iron, 24 ft. apart, forming 840 ft. of continuous roofing over the former London & North Western Railway section of the station. This roof was designed by Mr. William Baker, then Chief Engineer of the L.N.W.R., and its construction was carried out by Fox, Henderson & Co. Ltd., of Smethwick. For over 90 years the roof stood up well to all normal stresses and strains, but wartime bombing finally rendered it unserviceable; and having regard to the contemplated replanning and modernisation of the station, it was decided to remove it and replace it temporarily with individual platform roofs of the awning type.

A feature which created an unusual problem when planning the demolition was the variation in the spans of the trusses. Owing to the layout of the station being on a curve, which is wider at the London end of the station than the other, trusses varied in span from 212 ft. to 190 ft. 9 in. (As a matter of interest, the maximum span of the St. Pancras Station roof, constructed considerably later, is 240 ft.)

The trusses of the original roof were built up as follow:—

Bow of truss: 4 angles 6 in. × 3 in. × ½ in.
Web plate: 15 in. × 11/16 in.
Bottom tie: 4 in. dia. rod.
Struts: 4 angles 2½ in. × 2½ in. × 5/16 in.
Diagonal flats: 5 in. by ⅝ in.
Height from rail level to underside of truss at eaves: 33 ft.
Radius to underside of largest span bow: 155ft. 2½ in., and the versed sine, 40 ft. 6 in.

A further problem which arose in connection with the demolition had been created unwittingly in 1906, when the roof was strengthened. This strengthening was carried out as a safety measure after the collapse of a similar roof at Charing Cross Station, London, through the failure of a smithed weld in the bottom tie of one of the trusses. At New Street the total weight of 1,050 tons of wrought and cast iron forming the original roof was increased by a further 200 tons of steel in the form of additional bottom ties. The new strengthening ties were made up of two steel flats, 6 in. × ¾ in., supported by rods slung down from the panel points on the arch. A load of 24 tons was induced in each new bottom tie in order to relieve the tension in the existing ties, and this produced a condition which had to be watched carefully during demolition.

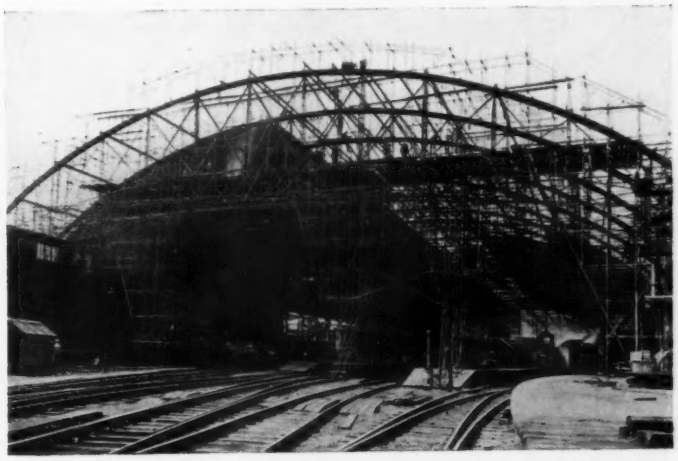
Of the 36 trusses supporting the roof, access for purposes of demolition was obtained in the case of 9 trusses by means of tubular steel scaffolding built up from the permanent way; the remaining 27 were dismantled with the aid of two travelling steel gantries which moved along a track built on the platforms. The trusses were burned down by the oxy-acetylene method in 5-ft. lengths, to suit the subsequent furnacing of the metal. As they were cut away, the lengths were lowered from their positions directly down into wagons on the track below by means of catheads fixed to the scaffolding.

Method of Kick Resistance

In the removal of the first nine trusses, the tubular scaffolding was built up from the railway tracks in bridge formation to avoid interference with trains using the station.

The scaffolding was carried right up to the top of the arch of the roof and so arranged that the arched boom was cradled every ten feet. The same procedure was applied to the original and strengthening ties. The cradling at 10-ft. intervals was carried out in order to resist the kick which was expected to occur when the principal was cut. By this method the kick was transferred to the ground by the scaffolding without affecting the columns on the one side of the roof and the wall on the other.

To minimise the kick, the top boom was cut starting at the crown, along the centre of the web, thus reducing the area of resistance to the induced load of 24 tons applied by the additional bottom ties erected in 1906.



Tubular scaffolding erected for demolition of trusses of old roof

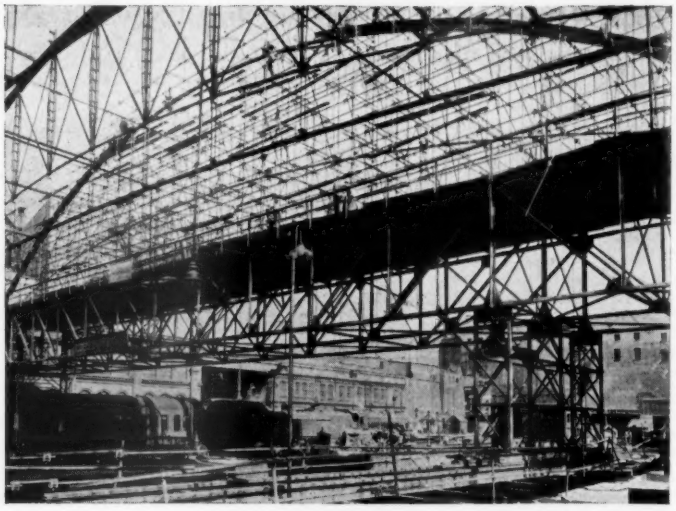
The two travelling gantries used in the removal of the remaining 27 trusses were designed by Mr. W. K. Wallace, and made and erected by Rubery Owen & Co. Ltd., of Darlaston, Staffs. The gantries spanned the station across the

tracks and operated inwards from each end of the station towards the footbridge which connects the platforms at the station's centre.

Each gantry travelled along a track built up on the platforms and consisting of sections of bullhead rail laid on their sides—a bottom section fixed to the platforms and a top section fitted to the base of the gantry—with 3-in. dia. spheres running in the webs of the rails. Tubular scaffolding was erected on the gantries extending up to the arched boom of the truss and cradling it every ten feet.

The platform of each gantry was 25 ft. wide and constructed of timber with steel supports; each gantry carried 50 tons of equipment. As the gantries were moved to each new position, a portion of the scaffolding used for cradling the trusses had to be dismantled and re-erected beneath the next truss to be dealt with.

The total time taken for the demolition, with its peculiar difficulties and new problems, was 15 months, during which time there was a minimum of interference with the normal movement of the 200 trains using the station each day.



Demolition gantry at London end of station

Men and Materials Used

The number of men employed on the contract, which was carried out by the Altitude Contracting Co. Ltd., of Birmingham, was 85, and the shortest time taken to remove one truss was four days. In burning down one truss, thirty 165-cu. ft. cylinders of oxygen and six 200-cu. ft. cylinders of acetylene gas were used. The gas used to burn down the whole work comprised 1,900 oxygen cylinders each of 165 cu. ft. capacity, and 400 acetylene cylinders of 200 cu. ft. capacity each.

Working as far as possible concurrently with the engineers carrying out the demolition work, railway gangs erected over the platforms temporary roofing consisting of corrugated asbestos sheeting interspersed with Perspex sheets, supported on a simple steel framework. The steelwork was of the A.R.P. stock type, comprising mainly 12-in. × 8-in. and 24-in. × 7½-in. joists. In the construction of the temporary roof framework, 12-in. × 8-in. stanchions were used to support 24-in. × 7½-in. joist longitudinal beams, which in turn supported 24-in. × 7½-in. joist cross-beams at 20-ft. centres spanning over from platform to platform.

The roof covering was constructed with large section asbestos cement corrugated sheets, with the addition of Perspex sheets to provide dispersed natural lighting. Standard sheets, 5 ft. 6 in. long, were used throughout, with the covering following the line of the platform coping and projecting 3 ft. beyond the nosing of the platform. This ensured additional protection for the public using the platforms and at the same time avoided the necessity for a valance. To avoid cutting the sheets, any reduction in the overall width of the platform was taken up in the width of the gutters, which permit of this adjustment.

The rainwater pipes consisted of 6-in. diameter asbestos cement pipes with standard swan necks, spread at 120-ft. centres. These were designed to carry water from the cistern heads and roof gutters, both of which were formed in serviceable timber covered with bitumen felt. A complete drainage scheme was carried out in conjunction with the foundation work to deal with water from the awning roofs and surface water on the permanent way.

A New Power-Operated Truck Mover

Releasing shunting engines for heavier duties

SHOWN for the first time at the Mechanical Handling Exhibition, Olympia, was a new design of truck-mover designed to operate in railway sidings and marshalling yards. Made by B.S.A. Cycles Limited, Birmingham, this appliance, handled by one semi-skilled operator, will release shunting engines for more urgent work, and is capable of moving 100 tons of trucks under normal conditions on the level.

B.S.A. truck mover in operation

Basically, the appliance consists of a chassis with a single large driving wheel having an air-cooled petrol engine slung on one side of the chassis and a three-speed epicyclic reduction gearbox to balance it on the other. Between these two, a power-operated hydraulic ram is fitted. A special free-wheel device protects the mechanism should a down gradient cause the wagons to overrun the truck-mover.

In operation, the machine is run along a single rail until the ram is under a convenient point on the truck chassis, usually just in front of a buffer, and the ram is then brought into operation, exerting an upward thrust on the truck chassis sufficient to provide firm contact between the rubber-shod wheel of the truck-mover and the rail, though not sufficient to lift the truck itself clear of the rails. When the required thrust is obtained, the mechanism is put into low gear and the clutch engaged, the drive then being smoothly taken up on the rail and the truck moved forward at a slow walking pace.

The appliance is entirely self-propelled and will travel over rough ground to any part of a railway yard. It can be used to turn trucks on a turntable, and the special three-speed gearbox enables it to be operated efficiently on quite severe gradients. By means of a spring-loaded catch, the operator can insert the truck-mover between a line of trucks, and move the attached wagons while walking alongside.

Rebuilding the Recco Viaduct, Rome-Genoa Line

A reinforced concrete structure is to replace the temporary wooden viaduct now in use

AFTER several postponements, caused by the delay in delivery of concrete reinforcement from U.S. and Italian makers, the building of the permanent viaduct across Recco village, carrying the Genoa-Spezia section of the main line to Rome, was taken in hand recently. The original masonry viaduct was destroyed by an Allied air attack when the line was held by the Germans during the war and was replaced in March, 1946, by a temporary timber structure which was described and illustrated in our February 6 issue. The timber viaduct, a general view of which is seen in the accompanying picture, has been built somewhat to the south of the destroyed viaduct to enable the new permanent viaduct to be built in the alignment of the approach sections.

Unlike the old structure, which embodied a large number of narrow arches, the new viaduct, to be built in reinforced concrete, is to have six arches only. The span between centres of the pillars is to be 164 ft. (50 m.), while the clearance of each arch will be 137 ft. 9 in. (42 m.). The photograph reproduced shows the centring for five arches as erected early in April and the sixth arch, not visible in the illustration, is being built at the right-hand end. It is expected that this double-track viaduct will be completed by October this year.

The picture also shows the reconstructed remains of the waterfront of Recco; that part of the village which skirted the viaduct has disappeared. In the background is Camogli promontory, behind which is Rapallo, the well-known seaside resort. The reconstructed Recco Station is seen on the left of the picture at the end of the viaduct connecting it with the village. The timber trestles, above the goods train, covering the viaduct, carry the overhead electric contact line.

Completion of the project, in combination with other similar works, will accelerate traffic considerably, as speed restrictions are in force on the temporary structure, which carries only a single track. Previous to its erection passenger traffic was maintained by a bus service between the two sections of line. Steam traction was resorted to at this time, the Germans having dismantled the electric overhead system to replenish their copper stocks. The new electrified line carries d.c. current at 3,000 volts, replacing the 3-phase, 16⅔-cycle a.c. system, formerly used on this section.

The new viaduct under construction, with the temporary wooden structure in the background

SEGREGATION OF CLASSES IN SOUTH AFRICA.—The South African Minister of Railways has announced that as from August 16 a limited number of first class coaches on suburban train services would be labelled "For Europeans only."

U.S. RAILROADS "COMFORT" PROGRAMME.—It is reported that American railway companies which claim they are losing money, are meeting increasing competition from bus and air lines by earmarking $430,000,000 for a new programme of speed and comfort. Faster locomotives and more attractive coaches are to join such famous trains as the Union Pacific "City of Los Angeles," and the Santa Fe "Super Chief." The new streamliners will have air-foam rubber reclining seats, and sleepers complete with iced water, air conditioning, and thick-pile carpets. There will be plastic observation rooms on top of coaches. More trains than before will soon be equipped with supervised playrooms for children, first-aid service, and newsreel theatres.

A NEW SIMMONDS LOCKING NUT.—Simmonds Aerocessories Limited, Treforest, Glamorgan, recently has placed on the market a new locking nut, known as the Spinloc, which is available in all standard threads and sizes. This nut is free-running and in one piece. It has a convex base and two slots cut at an angle of 35 deg. to the base. These slots extend across the convex base of the nut from a line in the surface between the thread and the corner of the hexagon to a depth determined by strength and locking efficiency. When the Spinloc is threaded on to a bolt, normal tolerances allow it to be spun down the shank, this free running continuing until the base of the nut meets the contact surface and is positioned for tightening with a spanner. In final tightening, the downward force presses the convex base of the nut against the flat contact surface, in an endeavour to become flush with it over its whole area. It is claimed that the resultant assembly will withstand severe vibration and will compensate for fatigue. The nut can be screwed or unscrewed continually without loss of efficiency.

New 4-8-0 Freight Locomotives for the Central Argentine Railway

The first engines of this design, ordered from Robert Stephenson & Hawthorns Limited, and from the North British Locomotive Co. Ltd., have been shipped to Argentina

THE first engines of an order for thirty-five oil-burning 4-8-0 locomotives of new design, with double-bogie tenders, have been completed recently at the works of Robert Stephenson & Hawthorns Limited, at Darlington, and at the works of the North British Locomotive Co. Ltd., Glasgow. Several of these engines, which are known as "CS7" class, already have been shipped from Glasgow and Middlesbrough to Argentina. They are built to the designs and requirements of the Chief Mechanical Engineer, Central Argentine Railway, and under the supervision and inspection of Messrs. Livesey & Henderson, consulting engineers.

These engines, which are required for the 5 ft. 6 in. gauge, are designed to negotiate curves having a minimum radius of 120 m. Their tractive effort at 85 per cent. boiler pressure (225 lb. per sq. in.) is 32,340 lb., and their adhesive factor is 4·35.

Plate frames are used, the main frames being 1⅛ in. thick, braced throughout by flanged plate cross-stays and cast steel cross-stretchers and drag-castings. To resist heavy buffing shocks, the front end is well stiffened and the rear end is made very substantial. The buffers are of Turton-Platts No-weld type, and Spencer-Moulton buffer springs and auxiliary gear are provided. All driving bolts in the frame are turned with 1 in 96 taper shanks.

Case-hardened liner plates are provided for the front axlebox guides, and the hind axlebox guides have chilled cast-iron adjustable wedges. The axlebox hornstays, of forged steel, are fitted with adjustable screws.

The coupled axleboxes are of cast steel, fitted with Stone's No. 1 bronze bearings with anti-friction pads of Stone's toughened railway white bronze. The keeps for these axleboxes are of cast steel, with brass dust guards cast in halves and fitted with wool waste saturated with oil. Journals and guide faces are lubricated from oilboxes located on the platforms and provided with flexible oil-pipe connections.

Wheel centres are of cast steel, the tyres of the driving and intermediate coupled pairs being flangeless. Underhung bearings springs are adopted and are compensated in two groups; the hangers are fitted with Spencer's rubber auxiliary springs. The tender bogie wheels are of the solid rolled disc type.

The cylinders, 19 in. dia. and 26 in. stroke, are of cast steel, with the hind covers cast integral. Nickel alloy liners are used in the steam chests and molybdenum alloy liners in the cylinder barrels. Inside admission piston valves 14 in. dia., actuated by Walschaerts valve gear, give a maximum travel of 7 in. and a port opening of 2 in. at 80 per cent. cut-off. The lap is 1½ in., the lead $\frac{7}{16}$ in., and the port width 2 in. Screw reversing gear is fitted on the right-hand side of the engine, and is carried in a bracket attached to the frame.

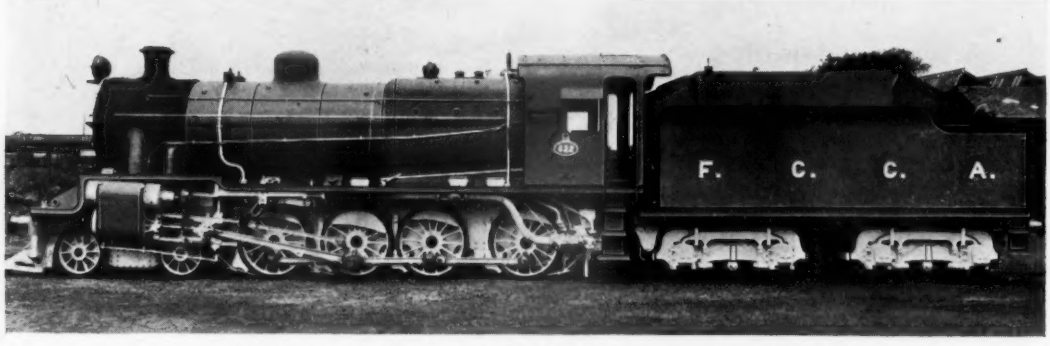
Cast steel is used for the front cylinder covers and for both steam-chest covers; the hind steam-chest covers have circular bronze bushes for the valve spindle guides. Piston rods and valve spindles are provided with Britimp metallic packing.

The piston, of cast steel, has a brass bull-ring cast on it, and is fitted with three hard cast-iron snap packing rings. Cast-steel crossheads are provided with cast-iron slippers, with insertions of Stone's toughened railway white bronze.

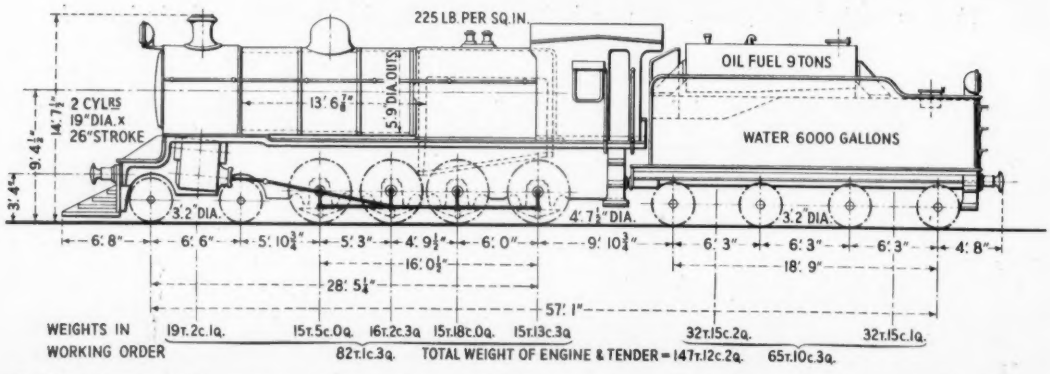
A steam brake is fitted on both engine and tender, working in conjunction with vacuum brake on the train; and the brake gear on both engine and tender is fitted with Walters renewable split steel bushes. Gresham & Craven steam sanding gear is applied to the leading and intermediate coupled wheels for forward running and to the trailing wheels for backward running. It is controlled by a single valve located on the right-hand side of the firebox backplate.

Boiler and Fittings

The boiler has a Belpaire firebox with a steel inner firebox riveted over the crown and sides, with the water legs welded in accordance with the Central Argentine Railway's practice. The length of the firebox is 10 ft. The barrel consists of three courses, the minimum inside dia. being 5ft. 4⅞ in. and the length between tube plates 13 ft. 6⅞ in. A



Oil-burning 4-8-0 locomotive for the Central Argentine Railway


225 LB. PER SQ. IN.
OIL FUEL 9 TONS
WATER 6000 GALLONS
2 CYLRS 19"DIA. x 26"STROKE
5'9" DIA. OUTS.
13' 6⅞"
14' 7½"
9' 4½"
3' 4"
3' 2" DIA.
4' 7½" DIA.
3' 2" DIA.
6' 8" — 6' 6" — 5' 10¾" — 5' 3" — 4' 9½" — 6' 0" — 9' 10¾" — 6' 3" — 6' 3" — 6' 3" — 4' 8"
16' 0½"
18' 9"
28' 5¼"
57' 1"
WEIGHTS IN WORKING ORDER
19T. 2C. 1Q. 15T. 5C. 0Q. 16T. 2C. 3Q. 15T. 18C. 0Q. 15T. 13C. 3Q. 32T. 15C. 2Q. 32T. 15C. 1Q.
82T. 1C. 3Q. TOTAL WEIGHT OF ENGINE & TENDER = 147T. 12C. 2Q. 65T. 10C. 3Q.

Outline drawing of the new goods locomotive, 35 of which are being built by Robert Stephenson & Hawthorns Limited and the North British Locomotive Co. Ltd.

"Melesco" superheater, by the Superheater Company, is installed.

Flexible roof stays are used in the front two rows of the crown, the remaining roof stays being of the plain screwed type. Flexible stays also are fitted in the breaking zones on the firebox sides.

As the engine is an oil-burner, the firepan is of massive construction, and is designed to carry the firebox brick lining. Both boiler and firebox are lagged throughout with Roberts plain lightweight Limpet brand asbestos mattresses; also an additional mattress is attached to the inside of the firebox clothing backplate.

Boiler fittings include two Ross Pop safety valves 4 in. in dia.; one Davies & Metcalfe No. 10 live steam injector on the right-hand side of the engine and one of the same maker's type H.J. exhaust injectors on the left-hand side under the platform, delivering water to a clackbox on top of the first boiler course; one Everlasting model W blow-off cock; and two water gauges by Baines & Co., Ltd. The steam turret is placed outside the cab.

A Wakefield type A.C. sight-feed lubricator is provided, and the vacuum brake combined ejector and steam brake valve is supplied by Davies & Metcalfe, Limited. A sandgun by Clyde Blowers is also fitted. The locomotive is equipped with J. Stone's electric lighting.

Oil Fuel Installation

The oil-burning equipment is the railway company's standard arrangement with gravity feed from the oil tank. Oil-fuel heating coils are located in a partitioned compartment at the front end of the tank, and an auxiliary heater is fitted under the firepan.

The burner, of the Asiatic trough type, is fixed in the front of the firepan, the flame being directed towards the firedoor. Steam supply is taken from a distributor on the left-hand side of the firebox back, which in turn is connected to the steam turret by a 1¼-in. nominal bore pipe.

Tender

Both the oil-fuel and the water tanks are of welded construction, the oil-fuel tank being supported on a wooden crib fixed to the top of the water tank.

The frames are built up from channel sections, angles, and plates, braced by flanged plates and castings, and riveted together. The 1-in. thick bogie frames are connected by means of a cast-steel cross-stretcher, which carries the bogie centre pivots, the brake gear, and spring gear.

The principal dimensions are :—

Cylinders (2), dia. × stroke	19 in. × 26 in.
Piston valves, dia.	14 in.
Valve gear	Walschaerts
Wheels, leading bogie, dia.	3 ft. 2 in.
,, coupled, dia.	4 ft. 7½ in.
Wheelbase, engine	28 ft. 5½ in.
,, coupled	16 ft. 0½ in.
,, tender	18 ft. 9 in.
,, tender bogie	6 ft. 3 in.
,, engine and tender, total	57 ft. 1 in.
Height, rail level to boiler centre	9 ft. 4½ in.
,, ,, ,, top of chimney	14 ft. 7½ in.
Width, over platforms	10 ft. 0 in.
Heating surfaces—	
Tubes	1,345 sq. ft.
Firebox	189 ,,
Total evaporative	1,534 sq. ft.
Superheater	358 ,,
Combined total	1,892 sq. ft.
Boiler pressure	225 lb. per sq. in.
Grate area	32·5 sq. ft.
Water tank, capacity	6,000 gal.
Oil fuel tank, capacity	9 tons
Weight of engine in working order	82 tons 1 cwt. 3 qr
,, tender in working order	65 tons 10 cwt. 3 qr.
Weight, total	147 tons 12 cwt. 2 qr.
Adhesive weight	62 tons 19 cwt. 2 qr.
Tractive force at 85 per cent. boiler pressure	32,340 lb.
Adhesive factor	4·35

Improved Battery-Driven Industrial Truck

New system of foolproof steering to give improved control

A NEW industrial truck has been introduced which is known as the Electric Eel on account of its exceptional manœuvrability combined with ease and safety of operation. By controlling the steering with an instinctive directional body movement the truck attains a high order of mobility and control.

Steering by Weight

The driver stands on a laterally pivoted platform and steers the truck by transferring the weight of the body from one foot to another in the direction of turning. The action is instinctive, responsive and effortless, enabling the truck to weave its way accurately through crowded aisles and to be manœuvred safely in confined spaces. The hands need never leave the speed and brake controls—an important safety feature—and these controls also provide the support required by the operator in making sharp turns. There are no pedals for the driver to operate, and the feet never leave the platform.

This instinctive bodyweight steering principle is an exclusive feature of all Electric Eel trucks. It operates on all four wheels in the case of the low-lift type and on two wheels on the Loadcarrier model.

The platform is sprung longitudinally to absorb road shocks, and folds to save space when the truck is not in use. The platform of the elevating truck is raised by an electro-mechanical operation. The lifting action has been specially designed to give the platform a slight backward movement while lifting takes place, thus preventing the goods on the stillage being damaged.

The starting, change of speed, stopping, and braking controls are positive and mistake-proof, and are all operated through one vertical hand-wheel, which always moves in the direction of travel, thus avoiding confusion with the controls. Even when operating the electric horn it is not necessary to remove the hand from the wheel, as the botton is conveniently placed on the boss, and can be pressed by one finger.

The chassis is robustly constructed with a deeper frame than usual for this class of truck; it is electrically welded and capable of withstanding heavy loading and rough usage. All models can be fitted with chequered steel plate platforms or wooden platforms, as desired. The truck is mounted on semi-elliptical leaf springs and the whole structure is of rugged strength and ample proportions.

Transmission

Two series-wound traction-type motors are installed, one fitted to each driving wheel, thus providing fully automatic differential effect, without the use of a mechanical gear. Each motor engages each driving wheel directly through a high-quality pinion, obviating intermediate reduction gear, chains, and cardan shafts. Transmission losses and wear and tear are reduced to a minimum.

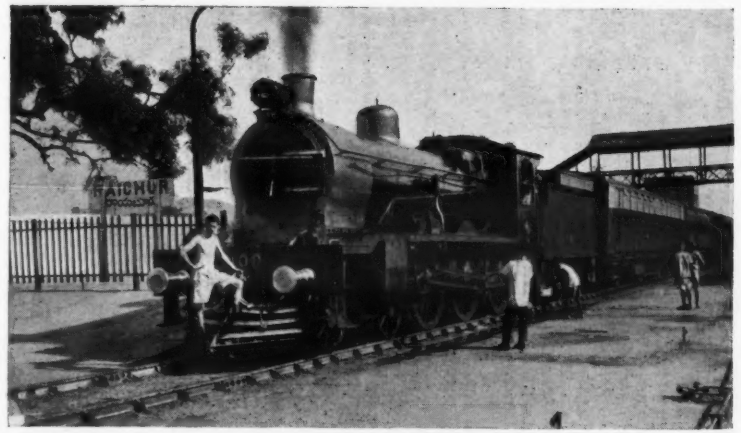
Three speeds in either direction are provided, and no reversing switch is required. Movement of the control wheel is regulated so that it is impossible to proceed from start to top speed without going through the various stages, thus protecting the motors in every way and assuring smooth operation. The same wheel also controls the electric brakes, which operate immediately the wheel has passed one notch either side of the neutral position. Electric and mechanical brakes are provided; the latter is operated by a "deadman's hand" lever. When the hand-grip is released, either deliberately or accidentally, the current is automatically interrupted and the brakes are applied. Interlocking devices prevent the simultaneous application of power and braking.

These trucks are made by Steels Engineering Products Limited, Sunderland, and the models available are the 30-cwt. Loadcarrier fixed platform truck, shown in the photograph reproduced above, a 50-cwt. elevating platform truck, a 40-cwt. tiering truck, and a heavy duty tractor.

Journey Across India

(Views taken by a correspondent during a journey from Madras to Bombay)

Madras to Bombay military special at Cuddapah, 161 miles from Madras, with M. & M.S.R. "XD" class 2–8–2



At Raichur, 440 miles from Bombay, a G.I.P.R. "D4" class 4–6–0 takes over for the run to Poona

G.I.P.R. 2–6–4 electric locomotive (nearest camera) on the train at Lonavla, on the electrified section from Poona to Bombay

Photos

Another view of the train, taken at Monkey Hill box on the Lonavla-Karjat section, showing the auxiliary braking locomotive

C. Williams

RAILWAY NEWS SECTION

PERSONAL

Lord John Hope and Mr. Arthur G. Dennis have been appointed Directors of B.E.T. Omnibus Services Limited.

Mr. Herbert Ashton, Assistant Locomotive Superintendent, Southern Railway of Peru, has been appointed Chief Mechanical Engineer, Central Railway of Peru.

Mr. Howard B. Chase, a senior officer of the Brotherhood of Locomotive Engineers, has been appointed a member of the Board of Transport Commissioners, Canada, in place of Mr. G. A. Stone, who has retired.

Mr. W. E. Macve, Chairman of the Licensing Authority for Public Service Vehicles and Licensing Authority for Goods Vehicles for the North Western Traffic Area, relinquished that post on July 31, to take up his new appointment under the Road Transport Executive as North Western Divisional Manager (Freight). Pending the appointment of a permanent successor, the Minister of Transport has appointed Mr. J. R. Williams (formerly Deputy Regional Transport Commissioner for North Wales) to fill the vacancy.

Mr. G. W. Hand and Mr. T. H. Burleigh, hitherto Local Directors, have been elected Directors of Firth Brown Tools Limited.

The late Captain E. W. Swan, who was a Member of Council of the Newcomen Society, and was keenly interested in industrial history, particularly of the North-East Coast, left (so far as can at present be ascertained) £101,988.

London Midland Region Staff Changes

The following staff changes are announced in the London Midland Region, British Railways:—

Mr. E. G. Brentnall, Acting Divisional Signal & Telegraph Engineer, Manchester, to be Assistant Signal & Telecommunications Engineer.

Mr. J. Leather, Executive Research Office, Euston, to be Assistant Advertising & Publicity Officer.

Mr. F. S. Darby, Assistant (Audit) to the Accountant, has retired.

Southern Region Staff Changes

The following staff changes are announced in the Southern Region, British Railways:—

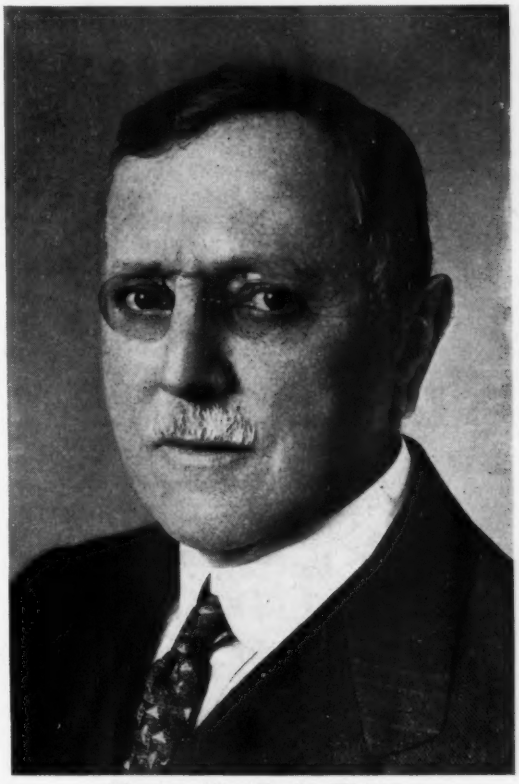
Mr. G Wynne Davies, Assistant Public Relations & Advertising Officer, is transferred to the Railway Executive.

Mr. H. Pittaway to be Architect, Chief Civil Engineer's Department, *vice* Mr. J. R. Scott, retired.

Mr. J. D. Atkins to be Deputy Assistant for Road Transport, Commercial Department.

Mr. J. H. Brown to be Indoor Assistant to Superintendent of Operation.

We regret to record the death on August 14, after a short illness, of Mr. Walter Kennedy Whigham, O.B.E., who was the last Deputy-Chairman of the London & North Eastern Railway Company and lately a Director of the Central Argentine Railway Limited. Mr. Whigham was born in 1878. From August, 1914, until January, 1919, he was on active service, first with the North Staffordshire Regiment, and afterwards on the staff of the 51st (Highland) Division until March, 1918, when he joined the headquarters of the 4th Army Corps. He was mentioned in despatches three times. In 1920 he was elected a Director of the North Eastern Railway Company. He continued as a member of the board of the L.N.E.R. on its formation in 1923, and on the death of the first Lord Faringdon in 1934 he became Chairman of the Finance Committee. On the death of Sir Murrough J. Wilson in 1946 he succeeded him as Deputy-Chairman of the company. Mr. Whigham was a Director of the Central Argentine Railway from 1926 until it was taken over recently by the Argentine Government. He was closely connected with banking; at the time of his death he was a Director of Robert Fleming & Co. Ltd., and he had been for many years a member of the Court of Directors of the Bank of England. He was also Chairman of the Railway Finance Corporation Limited and a Director of many other companies, and had been for some time a member of the Central Electricity Board. He was High Sheriff, County of London, 1923-24, and of Kent for 1935 and 1947. The funeral took place privately on August 18. A memorial service is being held at Canterbury Cathedral today (August 20) at 2 p.m., and one will also be held at St. James's Church, Sussex Gardens, London, W.2, on a date to be announced.



The late Mr. W. K. Whigham

Director, North Eastern and London & North Eastern Railway Companies, 1920-47; and Deputy-Chairman, L.N.E.R., 1946-47

Mr. Paul Oliver Sauer, M.P., who, as recorded in our June 11 issue, is the new Minister of Transport for the Union of South Africa, was born in 1898 and was educated at the Universities of Cape Town and Stellenbosch. He entered Parliament as the Member for Victoria West in 1929, but on the death, in 1933, of Mr. C. W. Malan, Minister of Railways & Harbours in the first National Government, was elected Member for Humansdorp, which he has represented ever since. In the last Parliament he was the Opposition Chief Whip. Mr. Sauer's father, the late Mr. J. W. Sauer, was the first Minister of Railways & Harbours of the Union.

The following appointments have been made by Bayliss, Jones & Bayliss, Limited: Mr. J. Irving to be Works Manager; Mr. H. P. Denny to be Chief Engineer; Mr. E. J. Page to be Bolt Works Manager.

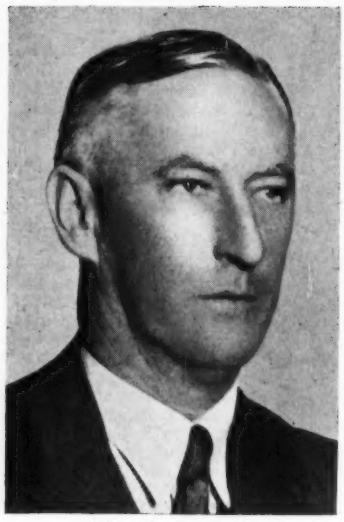
The boards of Bouts-Tillotson (B.T.C.) Limited and Holdsworth-Hanson (B.T.C.) Limited, acquired by the British Transport Commission and controlled by the Road Transport Executive, are constituted as follow:—

Bouts-Tillotson (B.T.C.) Limited: Messrs H. T. Dutfield (Chairman) (Member, Road Transport Executive); N. D. Fawkner (Principal Officer, Parcels, Road Transport Executive); N. R. Bellwood (Chief Accountant, Road Transport Executive); F. C. G. Mills (Divisional Manager, South Eastern Division, Road Transport Executive); Malcolm Holdsworth (Managing Director); Charles Holdsworth; Robert Hanson.

Holdsworth-Hanson (B.T.C.) Limited: Messrs. H. T. Dutfield (Chairman); N. D. Fawkner; N. R. Bellwood; the Divisional Manager, North Eastern Division, Road Transport Executive (not yet appointed); Charles Holdsworth; Robert Hanson.

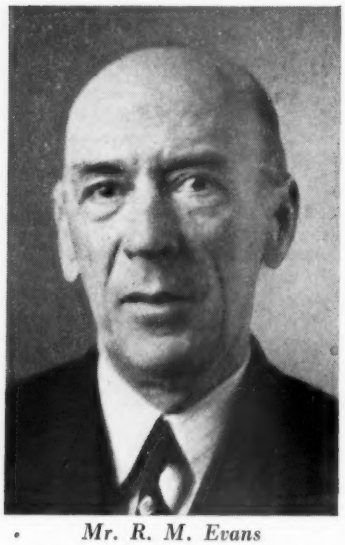
The Secretary of both companies is Mr. E. A. Wilkinson.

Mr. S. J. Hood, A.M.I.E. (Australia), Chief Civil Engineer, Western Australian Government Railways, has been appointed Acting Assistant Commissioner of Railways, to assist the Commissioner of Railways (Mr. J. A. Ellis) in the carrying out of additional duties resulting from a large post-war rehabilitation and reconstruction programme. The appointment is temporary, pending consideration of the findings of the recent Royal Commission of Inquiry into the Railway Department.



Mr. S. J. Hood

Appointed Acting Assistant Commissioner of Railways, Western Australia



Mr. R. M. Evans

Chief Traffic Manager, Western Australian Government Railways, 1944-48

Mr. O. M. Watson

Appointed Chief Traffic Manager, Western Australian Government Railways

Mr. Hood was born at Wangaratta, Victoria, in 1891. He later went to Western Australia, and received his early technical education at the Perth Technical School. He subsequently studied science and engineering at the Sydney and Melbourne Universities. He joined the Western Australian Government Railways in 1913, filling the positions of Draughtsman, Assistant Engineer, District Engineer, Assistant Chief Civil Engineer, and finally in 1934 was appointed Chief Civil Engineer. In recent years, during temporary absences of the Commissioner Mr. Hood has acted as Deputy-Commissioner.

Mr. R. M. Evans, who has retired from the position of Chief Traffic Manager, Western Australian Government Railways, joined that service as a cadet in 1900. He became a Traffic Officer in 1909, and served in the Perth, Bunbury and Narrogin Districts until 1913, when he went to the head office. After four years as Chief Clerk in the Merredin District Traffic Superintendent's Office, he became Timetables Clerk in the Chief Traffic Manager's Office, and was appointed Chief Transport Clerk in 1933. Two years later he went out as relieving District Traffic Superintendent, and in 1939 was appointed District Traffic Superintendent at Narrogin. In the next year he was appointed to the Perth District, and combined the posts of District Traffic Superintendent and Chief Clerk to the Chief Traffic Manager. Mr. Evans was appointed Chief Traffic Manager in 1944.

Mr. Oliver M. Watson, who has been appointed Chief Traffic Manager, Western Australian Government Railways, joined the railway service in 1900 as a messenger in the Perth telegraph operating room. He later entered the Chief Traffic Manager's Office as a cadet, and, after ten years in Perth, was transferred to the District Traffic Superintendent's Office, Bunbury, in 1912. Almost immediately after the declaration of war in 1914 he was transferred to Transport, Perth, where he served throughout the war. He was appointed Transit Clerk in 1922, and Clerk-in-Charge, District Superintendent's Office, Bunbury, in 1929. Shortly afterwards he returned to Perth, as Transit Officer, and he also served for a period on timetable work before being appointed Stationmaster, Bunbury, in January, 1939. Mr. Watson subsequently held a series of appointments as District Traffic Superintendent for various districts until becoming Assistant Chief Traffic Manager & District Traffic Superintendent, Perth, in December, 1947.

Mr. Joseph George Norton, hitherto Secretary to the Railways Staff Conference, who, as recorded in our July 16 issue, has been appointed Chief Personnel Officer to the Hotels Executive of the British Transport Commission, was educated at the Kilburn Grammar School.

Mr. J. G. Norton

Appointed Chief Personnel Officer to the Hotels Executive

Mr. E. R. Brown

Appointed Assistant Locomotive Works Manager, Crewe, London Midland Region, British Railways

Mr. L. M. Sayers

Appointed Operating Assistant to the Secretary & Manager, Cheshire Lines, British Railways

He joined the L.N.W.R. as an apprentice clerk in February, 1915, and after service in the Audit Department was transferred to the General Manager's Office in the same year. After war service in Palestine and France, he returned to the General Manager's Office, L.N.W.R., in 1919, and, subsequent to the amalgamation, continued in the General Manager's Office, L.M.S.R. In 1926 he entered the Labour & Establishment Department, dealing first with welfare matters and, from 1931, with wages and conditions of staff, negotiating machinery and other matters. For a period before the recent war he served on sub-committees of the Railways Staff Conference, and on the outbreak of war was transferred to the conference as Assistant Secretary. He was appointed Secretary of the conference in August last year, becoming also Secretary of the R.E.C. Staff Committee, the Special Joint Committee on Machinery of Negotiation for Railway Staff and the Railway Staff National Council, also Secretary of the Employers' Side of the Railway Shopmen's National Council, the National Railway Electrical Council, the Railway Workshop Supervisory Staff National Council, and the Railway Police Central Conference. During his experience of negotiations on wages and conditions of railway staff Mr. Norton has been closely concerned with the rates of pay and conditions of service of the staff in railway hotels, and particularly with the recent developments as a result of the establishment of a Wages Board for Hotel Workers under the provisions of the Catering Wages Act.

Mr. Ellis Rawdin Brown, A.M.I.Mech.E., A.M.I.Loco.E., Assistant Works Superintendent, Locomotive Works, Horwich, London Midland Region, British Railways, who has been appointed Assistant Works Manager, Locomotive Works, Crewe, received his general education at Derby and in Switzerland, and his technical education at Derby Technical College, of which he was awarded the certificate and diploma. He was an apprentice, 1924-25, and a privilege apprentice, 1925-29, at Derby Locomotive Works. He then served in the locomotive drawing office until 1931, when he was transferred to the Chief Mechanical Engineer's headquarters staff at Euston. He assisted the Chief Technical Assistant, and subsequently the Personal and Technical Assistant, to C.M.E. In January, 1941, he was appointed Chief Inspector (Aircraft) in the Locomotive Works, Derby, and, in the next November, Assistant to Works Superintendent (Inspection), Locomotive Works, Derby. He became Assistant Locomotive Works Superintendent, Horwich, in March, 1946. From 1940-46 Mr. Brown was Lecturer in Machine Design at Repton School. He is a member of the committee of the Manchester Centre of the Institution of Locomotive Engineers.

Mr. L. M. Sayers, who, as recorded in our June 18 issue, has been appointed Operating Assistant to the Secretary & Manager, Cheshire Lines, Liverpool, British Railways, was educated at Woodbridge and joined the L.M.S.R. at Belper in 1927. In 1932 he became a member of the first traffic and shunting analysis section when those sections were started on the L.M.S.R. by the late Lord Stamp. Mr. Sayers served as Assistant District Signalmen's Inspector, Lancaster Castle Control Area, and later Heaton Norris Control Area, from 1933 to 1935, when he became personal runner attached to the District Goods & Passenger Manager, Chester. He received subsequent appointments as Assistant District Controller, Peterborough, in 1936; Head Office Inspector (Freight Services), Derby, later in the same year; Assistant Stationmaster & Goods Agent, Heysham Harbour, in 1937; Stationmaster, Lancaster Castle, in 1940; Head Office Inspector (Passenger Services), Crewe, later in 1940; Acting Senior Clerk, Freight Services Section, Chief Operating Manager's Office, at headquarters, in 1943; Assistant Divisional Controller (Freight Services), Derby, in 1945; District Controller, Peterborough, in 1946; and Assistant District Operating Manager, Leicester, in 1947. During 1938, Mr. Sayers was a student at the inaugural session of the L.M.S.R. School of Transport, Derby. He is the second son of Mr. J. Sayers, at one time Telegraph Superintendent of the Midland Railway and subsequently of the L.M.S.R.

Mr. G. L. Evans, hitherto Chief Clerk to the Auditor of Freight Receipts, Montreal, has been appointed Auditor for Europe, Canadian Pacific Railway, in succession to Mr. H. G. Studd, who has retired.

Mr. F. F. Fowler has been appointed Chairman of the Employers' Panel of the Road Haulage Central Wages Board, and Leader of the Employers' Side, on the resignation of Mr. H. T. Dutfield, who remains a member of the panel. Mr. J. H. Male has been appointed Vice-Chairman, and Mr. Ralph Cropper succeeds Mr. G. W. Quick Smith as Secretary.

Mr. A. Morgan, Staff Assistant to the General Manager, Rhodesia Railways, has retired.

Mr. L. H. Kiek has resigned from the board of the Peruvian Corporation Limited, to restrict the number of his engagements.

Mr. K. N. Swash, hitherto Leeds Office Manager of Brookhirst Switchgear Limited, has been appointed Chief Engineer to the company.

Scottish Region Appointments

The following appointments are announced in the Scottish Region, British Railways:—

Mr. R. Gray, Trains Assistant to District Superintendent, Glasgow (Queen Street), to be District Controller, Motherwell.

Mr. A. G. Dawson, Stationmaster, Falkirk (Grahamston), to be Passenger & Parcels Agent, Edinburgh (Waverley).

Mr. W. L. Rigby, Assistant to District Engineer, Irvine, to be Assistant to District Engineer, Glasgow.

Mr. K. W. Foster (Chief Draughtsman, District Engineer's Office, Northampton, London Midland Region), to be Assistant to District Engineer, Irvine.

The following scholarships have been awarded by the Institute of Transport for 1948-49: Henry Spurrier Memorial Scholarships to Mr. D. J. Wilkinson (of Middlesbrough Transport Engineering Co. Ltd.), to attend the University of London (London School of Economics) as a full-time student; and Mr. R. B. Hounsfield (Lecturer on Traffic Engineering, University of London, University College), to investigate the volume and growth of road traffic around the central London area and the quantitative analysis of the parking problem in the central area; Silver Jubilee Scholarship to Mr. J. A. Williams (of Chief Commercial Manager's Office, London Midland Region, British Railways), to visit the U.S.A. to study the organisation, functions, and working methods of the Association of American Railroads. In addition, six Henry Spurrier Memorial Grants and five Sir William Chamberlain Memorial Grants have been awarded to assist part-time students.

Mr. Ashley S. Ward, for many years Chairman of Thos. Smith & Sons (Rodley) Ltd., has retired from the board. Mr. Frederick H. Smith has relinquished his position as Joint Managing Director, but remains on the board in an advisory capacity. Mr. F. R. Stagg has been appointed Chairman & Managing Director; Mr. W. H. Sharp, Joint Managing Director; and Mr. T. N. F. Smith, Assistant Managing Director.

Mr. William E. Corrigan, Vice-President of the American Locomotive Company, has been placed in charge of sales of the Locomotive Division, including direction of all sales activities of district sales offices. He will have offices in Schenectady, N.Y., but will also maintain an office in New York City. The office of Vice-President of Eastern Regional Sales, formerly held by Mr. Corrigan, has been abolished.

Guest, Keen & Nettlefolds Limited has announced the constitution of the boards of its two newly-formed subsidiaries as follows:—

Guest, Keen & Nettlefolds (Midlands) Limited: Mr. K. S. Peacock (Chairman & Managing Director), Mr. J. H. Jolly, Mr. A. F. Gadsby, Mr. M. H. Tollit, Sir A. H. M. Bowlby, Mr. W. W. Fea, Mr. S. Lloyd, Mr. W. A. Nicol.

Guest, Keen & Nettlefolds (South Wales) Limited: Mr. K. S. Peacock (Chairman & Managing Director), Mr. J. H. Jolly, Mr. A. F. Gadsby, Mr. M. H. Tollit, Mr. N. R. R. Brooke, Mr. W. W. Fea, Mr. W. A. Nicol.

We regret to record the death on August 15, at the age of 59, of Mr. P. N. Humphry-Baker, A.M.I.C.E., sometime Officiating Deputy Chief Mechanical Engineer, East Indian Railway.

Mr. F. H. Petty, Assistant Locomotive Running Superintendent, North Eastern Region, British Railways, has been appointed Motive Power Superintendent, North Eastern Region, in succession to Mr. C. M. Stedman, who has retired.

South African Railways & Harbours

Mr. W. B. A. Ritchie, System Manager, Durban, has retired, and has been succeeded by Mr. D. P. McDonald, hitherto System Manager, East London.

Mr. H. V. Taylor, System Manager, Cape Town, has been appointed System Manager, East London.

Mr. H. A. Gregorowski, System Manager, Bloemfontein, has been appointed System Manager, Cape Town.

Mr. C. J. H. Schoombie, System Manager, Kimberley, has been appointed System Manager, Bloemfontein.

Mr. J. G. Pauling, Inspecting Engineer (Maintenance), has been appointed Maintenance Engineer, Chief Civil Engineer's Office, Johannesburg.

Mr. A. Goldstein, Civil Engineer (Research), has been appointed Inspecting Engineer (Maintenance), Chief Civil Engineer's Office, Johannesburg.

Mr. I. J. Mair, System Engineer, has been appointed Inspecting Engineer (Maintenance), Chief Civil Engineer's Office, Johannesburg.

George Stephenson Centenary Commemoration

The opening stages of the various arrangements made by the Borough of Chesterfield to commemorate the centenary of the death of George Stephenson took place on Thursday of last week (August 12), the actual centenary day. The proceedings were opened by the Mayor (Alderman Edgar Smith), and then Councillor H. C. Martin, the Chairman of the Stephenson Centenary Committee, introduced the Right Hon. Lord Kennet, President of the Association of Municipal Corporations.

Lord Kennet said that it was a cheerful occasion, inasmuch as it was the commemoration of the life of a man who served his generation in an outstanding way, and reaped the reward of his services. George Stephenson did not invent very much, but he was a great utiliser. His genius was not in the sphere of theory, but his work was of immeasurable practical benefit in increasing the material wealth of our land. Of course, his life constituted a "success" story, and, incidentally, showed that the necessity for scholastic education was not an absolute rule. On the whole, it was probably a good thing that he did not have the drilling that the educationalists would desire, for that would probably have turned him into an ordinary good citizen and destroyed his highly individualistic genius. It might be contended that, in giving us railways, he gave us the right sort of machinery with which we could be trusted. Most subsequent inventions, such as the internal combustion machine, had been adapted for war purposes.

The vote of thanks to Lord Kennet was proposed by Miss Violet R. Markham (Mrs. Carruthers), who lived for many years in what was formerly Stephenson's home at Tapton House, and was the granddaughter of Stephenson's friend, Sir Joseph Paxton. The vote was seconded by Mr. George Benson, M.P. for the Chesterfield Division. A presentation to Lord Kennet, consisting of an oak mounted barometer, was made by Trevor Graham, the head boy of Tapton House School. Shortly afterwards, the Mayor paid a private visit to Holy Trinity Church, where George Stephenson is buried, and laid a wreath. Another wreath was sent by the Institution of Mechanical Engineers, of which Stephenson was the first president.

On the same day there were opening ceremonies of the various other features of the commemoration, namely, the exhibition of the National Coal Board in Ashgate Road Drill Hall; the Engineering Exhibition in Boythorpe Road Drill Hall; the British Railways Exhibition at Market Place Station (the one-time terminus and headquarters of the Lancashire, Derbyshire & East Coast Railway); and the Stephenson Relics & Documents Exhibition in the Stephenson Memorial Hall.

The British Railways Exhibition was open to the public from 10.30 a.m. to 7.30 p.m. on the four days August 12 to 15 inclusive. Admission was 6d. for adults and 3d. for children. On the Sunday (August 15) there was another opening ceremony by the "railway queen." The exhibits, which were attractively displayed, included both ancient and modern rolling stock, and also two vans of small exhibits. The ancient rolling stock consisted of Queen Adelaide's coach, built in 1842; Queen Victoria's saloon, built at Wolverton in 1869, and rebuilt in 1895; a facsimile of the *Rocket;* the *Lion* locomotive of 1838; and early Midland Railway locomotives. There were modern examples of passenger and goods rolling stock and locomotives, including No. 45529 of the converted "Patriot" class, just renamed *Stephenson.*

The small exhibits, arranged in parcels bogie vans, included many documents of interest, some of them bearing the signature of George Stephenson. The walls were decorated with coats of arms of railway companies from the collection of Mr. George Dow. One item of particular interest was a volume of our constituent *The Railway Times* for 1839, open at the announcement of a subscription list for a George Stephenson memorial as a tribute to his genius, to which our predecessors contributed ten guineas. (See page 208).

Local branches of the railway trade unions organised a centenary ball in the Odeon Ballroom, Chesterfield, on Friday, August 13, at which the railway queen, Miss Janet Taylor, was the guest of honour.

On Sunday there was a civic commemoration service in Holy Trinity Church in the afternoon, and a commemoration service at Chesterfield Parish Church in the evening.

The Newcastle Celebrations

Newcastle-on-Tyne began its centenary commemoration with a civic visit on August 12 to the locomotive works of Robert Stephenson & Hawthorns Limited, where was noted the large part that they are playing in the export drive, with orders from India, Burma, South Africa, South America, Australia, and New Zealand.

A 71-year-old draughtsman, William Steele, and a 15-year-old apprentice, Alan Glover, the firm's oldest and youngest workers, together with Newcastle's railwayman Lord Mayor (Alderman T. McCutcheon), placed wreaths on the George Stephenson Memorial in Westgate Road, Newcastle.

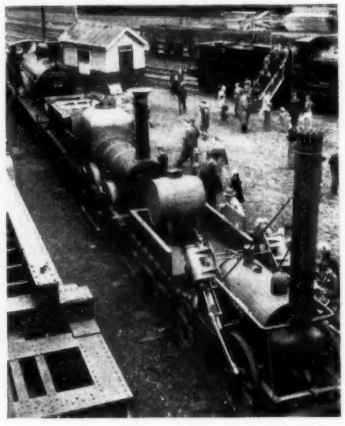
Lord Ridley opened an exhibition in the Laing Art Gallery, Newcastle, dealing with Stephenson's life and achievements. In connection with this Exhibition, which is remaining open until August 21, the Curator, Mr. C. Bernard Stevenson, has prepared an informative and well-produced 36-page catalogue together with twelve art plates.

Modern Rolling Stock

The British Railways contribution to the proceedings in Newcastle took the form of an exhibition of modern rolling stock in the three bay platforms at Manors Station on Sunday, August 15. There were six locomotives of former L.N.E.R. types, namely, an A.4 engine, one of Gresley's famous streamline locomotives, No. 60016, *Silver King;* a B.1 engine, No. 1100, in the L.N.E.R. enumeration (now No. 61100); an A.2 engine in the green livery, No. 60512, *Steady Aim;* an A.3, No. 60036, *Colombo,* in the new blue livery; an O.7, No. 63078, in black; and an L.1, No. 67728, also in black. In addition there was a Burma Railways engine loaded on a special locomotive-carrying truck lent by Robert Stephenson & Hawthorns Limited, a twin vehicle of the "Coronation" set, a third class coach with the new transverse corridor system, a first class sleeping car, a third class sleeping car, a restaurant car, a buffet car, and a first and third composite coach of the latest type. The Gateshead breakdown crane completed the display.

The exhibition was opened at 10 a.m. by the Lord Mayor. Mr. Paul Gibb, Goods Manager for the North Eastern Region of British Railways, was in the chair, and representatives of all departments of railway activity in Newcastle and the North were present. The exhibition was open to the public from 10 a.m. to 8 p.m. All the proceeds of the exhibition will be divided between local and railway charities.

Visitors to the Stephenson Centenary Exhibition at Chesterfield examining London Midland "Patriot" class locomotive, No. 45529 "Stephenson"



A model of the "Rocket," with the "Lion," and M.R. No. 118

Manchester Track Renewal

On Sunday, August 15, engineers of the Eastern Region of British Railways started the task of relaying nearly half-a-mile of track at London Road Station, Manchester. Although a part of the normal renewal programme, it is a task which has called for careful organisation, to minimise delays to normal train services. Three platform lines are being renewed as well as twenty sets of crossings and fourteen rail switches. The entire installation was pre-assembled in the engineer's yard at Guide Bridge and was composed of 341 separate track sections, comprising sixty wagon loads, twenty-six of which were out-of-gauge.

An interesting feature has been building-up certain of the crossings with parts made to local design and the entire work has entailed the use of 4,000 ft. of new timber and 40 tons of steel rails. More than a thousand cast-iron chairs, 4,000 screws, 540 fish-bolts and 252 fish-plates are among the other materials used.

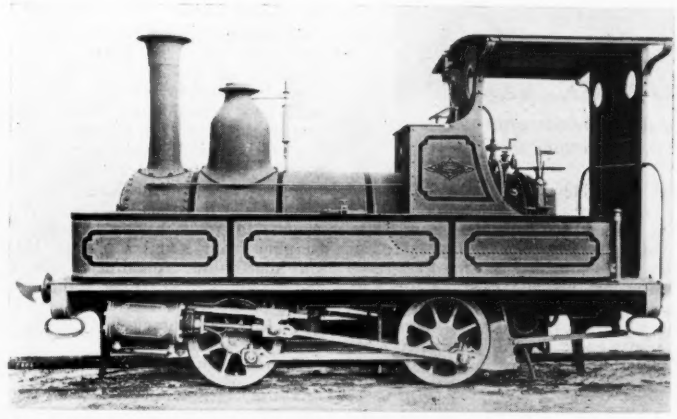
The track pre-assembly has greatly simplified the work of changing over from mechanical interlocking to electrical track-circuiting, which is a feature of the renewal. With the new track laid out complete in the yard, members of the Signal & Telegraph staff have been able to work uninterruptedly on their portion of the task. The rail has had to be cut at many points, because of the large number of insulated joints required; carrying out this work would have seriously delayed traffic had pre-assembly not been adopted.

Four hundred tons of new granite chippings will be used for ballast, and the working of the ballast and out-of-gauge engineer's trains has been arranged by Mr. G. W. Stewart, District Superintendent, Manchester, so as not to disrupt normal services.

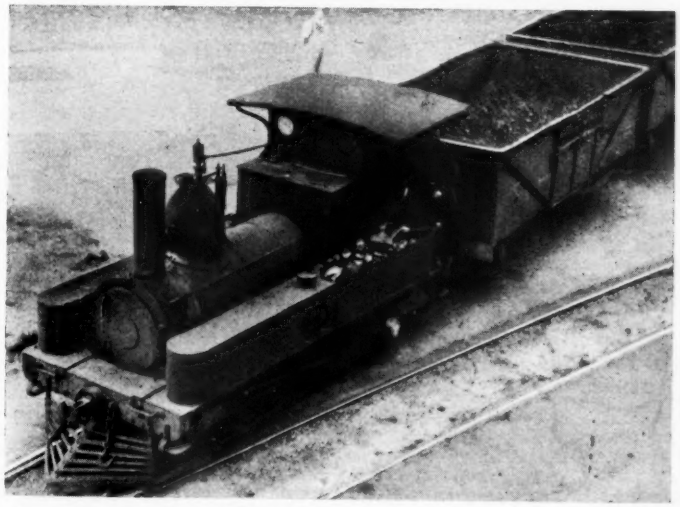
The engineering work has been planned and carried out by Mr. E. A. J. Bilham, District Engineer, Guide Bridge, Eastern Region, and his district staff, including Chief Permanent Way Inspector H. L. Miles, who has handled the whole of the detailed arrangements.

The work will be completed on Sunday, August 22. Two platforms at London Road Station are closed on each Sunday, and alternative arrangements have been made to handle passenger services with a minimum of inconvenience to the public.

75 Years of Service



One of twelve engines built in 1873 *by Dübs & Company for New Zealand. The weight in working order was* 10·5 *tons and the tractive effort was* 2,880 *lb.*



At a Dunedin, New Zealand, City Council meeting it was suggested this Dübs-built engine, still working at the Corporation gasworks after 75 *years' service, be preserved in the Early Settlers' Museum. A diesel engine is to be purchased on the veteran's retirement*

Photo] [*Dunedin "Evening Star"*

Improving African Water Communications

Details of schemes for improving port facilities and the inland water transport system of West Africa and Uganda, and for increasing the movement of groundnuts from Nigeria, were announced recently by Mr. A. J. F. Bunning, Adviser on Inland Transport to the Secretary of State for the Colonies.

The rivers Niger and Benue, which bring down much of the tonnage of Nigerian groundnuts, are to be dredged at their deltas to allow ocean-going ships to load much larger cargoes direct at the delta ports, where at present they are limited to a 14-ft. draught. About 30,000 tons are at present brought down by rail to Baro, on the Niger in central Nigeria, and transhipped to river boats for the onward journey to the ports. If surveys of the Niger now being carried out show that, by dredging, the river channel can be deepened, or that the river may be kept open longer than the present six months, movement of groundnuts by this route can be increased. This will ease the strain on the Nigerian Railway, as the distance from the north to Baro is only half of that to Lagos. Baro to Lagos is some 250 miles in a direct line and considerably more by rail, *via* Minna.

Also under review is the provision of bulk-handling equipment at West African ports, obviating the present method of stowing in bags. This is dependent on whether northern European ports, for which most of the groundnuts and palm kernels are destined, can unload bulk cargoes, a matter which is now under investigation.

River Navigation in Uganda

The possibility of making navigable the Unga river in Uganda is being explored. This waterway would then form a transport artery between Lake Victoria and the Ruwenzori district, which is rich in minerals, particularly copper, and is not served by the Kenya & Uganda Railways. Shallow-draught vessels could then bring products from the Ruwenzori to Lake Victoria. Copper ore would be taken to Jinja, on the lake, where a hydro-electric scheme is being examined; the ore would be smelted there so that the copper would be ready for use.

If the African lakes were joined it would be possible to travel by water from Cairo almost to the Zambesi, but this is a long-term project involving much more examination. At present steamers ply between the Sudan and Lake Albert.

On page 99 of our July 23 issue appeared a map of Africa, accompanying an article entitled "A Railway Lifeline Across Africa?" which will be found helpful also to an understanding of the inland waterways of the continent.

Flood Damage and Dislocation in the North

Diversion of Anglo-Scottish services brought about by the disruption of East Coast line

Metals of East Coast main line suspended in mid-air after collapse of bridge over the River Eye at Reston

The worst floods for many years in Northumberland and south-east Scotland followed torrential rainfall during the middle of last week. Main and branch lines of the North Eastern and Scottish Regions of British Railways suffered severe damage, the worst affected being the East Coast route between Newcastle and Edinburgh, which was blocked in eleven places.

"The Flying Scotsman" leaving Kings Cross at 10 a.m. on August 12 had to be diverted from Newcastle *via* Carlisle and Carstairs, and reached Edinburgh at 3.51 a.m. on August 13, some ten hours late. The Waverley route was at first used for diversions, but this also became threatened by flood waters, which caused the 10.5 a.m. from Kings Cross to Edinburgh on August 12 to be stranded at Tynehead, whence passengers were eventually conveyed to Edinburgh by buses. Beyond Tynehead some culverts were considered unsafe, and at places the tracks were suspended over 15 ft. chasms. Also on the Waverley route, at Galashields, a stream overflowed and carried tons of debris through the station.

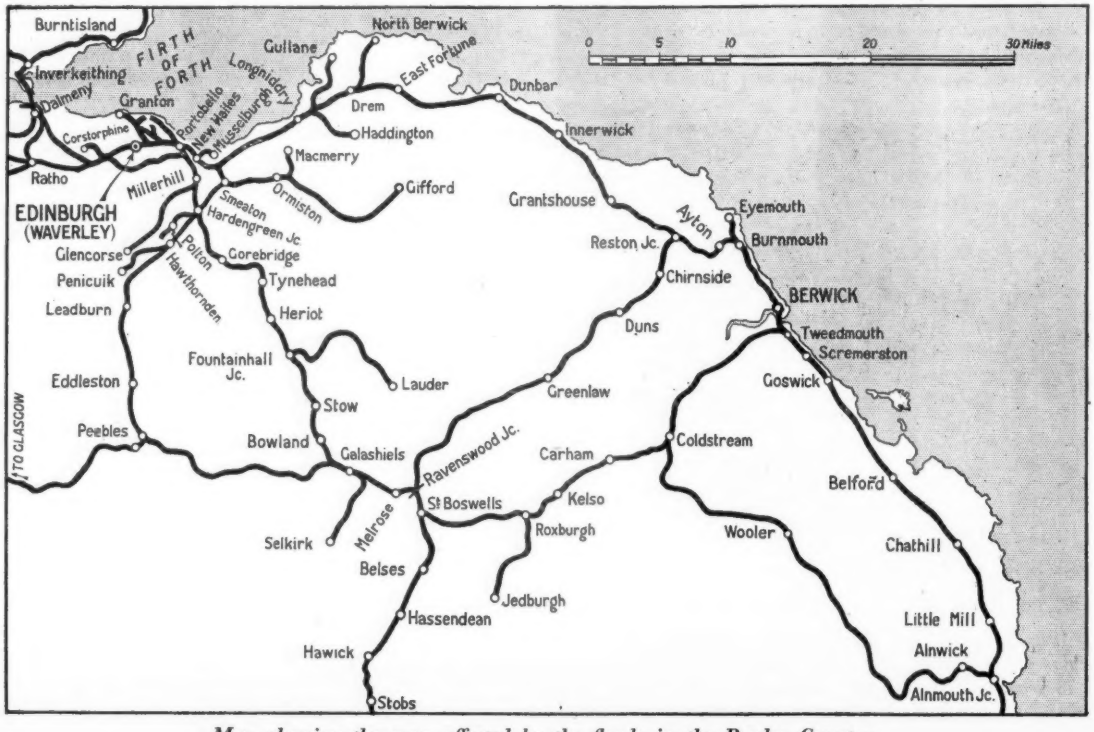
On the East Coast main line flooding occurred at Grantshouse, Burnmouth, Chathill, Little Mill, and Belford, and between Goswick and Scremerston. At Grantshouse all the piers of a bridge were washed away, leaving only the metals spanning a 30 yd. gap. The signal box at Berwick was put out of action.

On the Eyemouth branch, Eyemouth station was flooded and the centre pier of the viaduct over the River Eye was carried away. Some four million tons of flood water were held back only by an embankment carrying the Eyemouth branch, near Ayton. On August 16 there was still no sign of a fall in the level of the water, which was threatening the town of Eyemouth. Digging of two channels at the top of the embankment was stopped the following night, as it was thought to be weakening the embankment, and work on another channel further along the embankment began.

On August 14 the North Eastern Region stated that the East Coast line had been reopened as far north as Berwick, with single-line working in force between Goswick and Tweedmouth North. (Double-line working has since been restored).

The Alnwick-Coldstream line was blocked by a broken bridge at Mindrum, but the Tweedmouth-Kelso line was reopened for goods trains. As from August 14, "The Flying Scotsman" began running from Kings Cross to Edinburgh *via* Shaftholme Junction, Leeds, Carlisle and Carstairs. All other trains continued to be diverted *via* Newcastle and Carlisle. A 2- to 3-hr. average delay to East Coast expresses was expected.

Engineers of North Eastern and Scottish Regions, who were out on August 13 sur-



Map showing the area affected by the floods in the Border Country

veying the widespread damage, expected that repair of the effects of some of the minor flooding was possible at the week-end, but where foundations were affected a special survey was necessary. A further landslide blocked the Tweedmouth-Kelso branch at Carham, near Kelso. Also the Eskbank-Polton, Penicuik, Eyemouth, St. Boswells-Reston, Jedburgh, Selkirk, and Peebles branches were all closed. Many passengers were marooned, and were later taken by road to their destinations. At Chirnside a train stood all night with 13 to 15 passengers, some of whom were only ten miles from their destination.

The 10.10 a.m. Edinburgh (Waverley) to St. Pancras and the 10.37 a.m. Edinburgh (Waverley) to Leeds trains on August 13 were combined. "The Queen of Scots" Pullman, due to leave Glasgow (Queen Street) at 10.15 a.m. on August 14, ran *via* Carstairs, where connection was made from Edinburgh.

The Railway Executive announced on August 16 that the East Coast line remained blocked at several points between Berwick and Dunbar. Between Berwick and Burnmount, Ayton and Reston, Reston and Grantshouse, and Grantshouse and Cockburnspath seven underbridges had been washed away. Between Grantshouse and Cockburnspath also, serious subsidences had undermined the track. When the lines were broken, some goods trains were trapped, but arrangements were being made to remove the goods.

Traffic was still being diverted *via* Newcastle, Carlisle, and Carstairs. The Waverley route, blocked by floods and landslides at various places between Galashields and Bonnyrigg, was opened again for single-line working on August 16. Several trains, including "The Flying Scotsman" southbound, used the Waverley route in the morning, but afternoon trains reverted to the Carstairs route. The Penicuik branch was reopened also. It was expected that the Tweedmouth-Kelso-St. Boswells route would become available as a diversionary route, and, beginning with the 7.50 p.m. train from Waverley on August 16, Edinburgh-Kings Cross trains were diverted over this route, instead of *via* Carstairs. Northbound trains continued to use the Carstairs route, but if the Tweedmouth-St. Boswells diversion was found successful, they would shortly use it also; it was expected that from 1-1½ hr. would be saved, compared with the Carstairs route.

The complete restoration of the main line is likely to occupy two months. The Railway Executive has been in close touch with the War Department, which is assisting with men and materials, but a North Eastern Region statement announced that that region would not seek military aid. It is expected that it will be years before the East Coast route bridges are rebuilt permanently. The damage is stated to be one of the worst disasters which the Newcastle-Edinburgh line has suffered since its opening in 1846.

Mr. J. C. L. Train, Member of the Railway Executive, has visited the affected areas and made a survey of the damage. Sir Eustace Missenden, Chairman of the Railway Executive, has sent a personal letter to Mr. T. F. Cameron, Chief Regional Officer, Scottish Region, in the course of which he says: "the Executive and I desire to express keen appreciation of the splendid work done by the officers and staff of the Scottish Region in dealing with this very exceptional emergency, and I should be glad if you would make this known to all concerned."

Notes and News

Electrical/Mechanical Senior Draughtsman Required.—Applications for the position of electrical/mechanical senior draughtsman are invited by Merz & McLellan, Milburn. Esher, Surrey. See Official Notices on page 227.

Senior Draughtsman (Engineering) Required.—A senior draughtsman is required by the East African Railways & Harbours for two to four years with prospect of permanency. See Official Notices on page 227.

Railway Mechanical Engineer Required.—A railway mechanical engineer, with experience in the design of railway vehicles of all types, is required by the Aluminium Development Association on its permanent staff. See Official Notices on page 227.

Accountant Required for the Gold Coast.—An accountant, between 24 and 35 years of age, is required by the Government of the Gold Coast for the railway department for two tours of 18 to 24 months, with prospect of permanent and pensionable employment. See Official Notices on page 227.

McNamara Purchase Terms Accepted.—The directors of McNamara & Co. Ltd. state that an offer to purchase the business by the British Transport Commission has been accepted subject to contract. It is anticipated that there should be available for distribution to stockholders approximately 33s. per 12s. stock unit.

Vacancies in Australia.—Applications are invited by the Agent-General for Queensland, Australia, 409-410, Strand, W.C.2, from persons desiring to join the service of the Commissioner for Railways, Brisbane, Queensland. Australia, in the following capacities:—Designing civil engineers, two civil engineering draughtsmen (first grade), and two survey draughtsmen (first grade). For full details see Official Notices on page 227.

Pullman Car Company.—The Pullman Car Company proposes, when a suitable opportunity occurs, to pay off or satisfy by means of a new issue of preference shares, the whole of the outstanding 5 per cent. cumulative income stock. The outstanding amount of this stock, exclusive of interest, was £380,246 at September 30 last. A resolution providing for the creation of 500,000 new 4½ per cent. cumulative redeemable preference £1 shares, of which it is intended to issue up to about 380,000, will be put to an extraordinary meeting of shareholders on September 7.

Clyde Coast Excursions.—The Scottish Region of British Railways has introduced day excursion fares between certain Clyde Coast piers from Monday, August 16. Day fares also are being given by rail and steamer from Glasgow (*via* Craigendoran, Gourock, Wemyss Bay, or Fairlie) to a number of Firth of Clyde piers. In addition to Glasgow Central, Queen Street and St. Enoch stations, day excursion tickets will be issued at a large number of Glasgow suburban and district stations, as well as at Paisley, Singer, Dumbarton, Greenock and certain other Ayrshire and Renfrewshire stations. The day tickets will be issued for the *Duchess of Montrose* cruise to Arran, *via* Kyles of Bute and Garroch Head; Arrochar *via* Craigendoran or Gourock; Cambeltown *via* Craigendoran, Gourock, or Fairlie; Inverary; Kyles of Bute; Lochranza; Lochgoilhead, and in association with David MacBrayne Limited to Tarbert (Loch Fyne) and Ardrishaig.

Institute of Transport Anniversary Luncheon.—The 1948 anniversary luncheon of the Institute of Transport will be held on Tuesday, November 2, when the address will be given by Sir Eustace Missenden.

Emu Bay Railway Company.—The directors' report for the year ended December 31 last shows a credit balance of £3,683 on profit and loss account. After adding £22 brought in, £2,945 went in payment of 2½ per cent. interest on the 4½ per cent. debenture stock, and £739 on provision for exchange on that interest. The sum of £21 is carried forward. The railway operates 88 miles of 3-ft. 6-in. gauge line in Tasmania.

Greenock Railway Horse Show.—Greenock Railway Horse Show and Parade took place recently at Lynedoch Goods Station, Greenock, when prizes were awarded for the best-kept Goods Department horse, the best-kept goods and parcels horse, and the best-kept parcels horse; and the Riddell Challenge Cup was competed for by Greenock carters and parcels van boys. Provost Morris (Greenock), Provost Minihan (Port Glasgow), and Mr. William Yeaman, Commercial Superintendent, Scottish Region, British Railways, were among those present, and Mrs. Yeaman presented the prizes.

Thos. Firth & John Brown Limited.—At the recent annual meeting, the Chairman, Lord Aberconway, said that the trading results showed an improvement over the preceding year, during which they themselves and many of their customers had been involved in the transition from war to peace production. Research was a fundamental part of the company's activities, and their programmes were planned over a considerable period of time. The results of their research work were to be seen in the steels developed for use in high-pressure steam installations, and now for use in the gas turbine. Their new engineering division was nearly completed. They had established a subsidiary company, F.B. Engineers Limited, through which the commercial activities of their engineering division would be operated.

Pressed Steel Co. Ltd.—At the recent annual meeting of the company, the Chairman, Major Albert Pam, said that their profit had increased from £254,000 a year ago to nearly £306,000, after making full provision for depreciation and obsolescence, providing an additional sum of £50,000 for contingencies, and making ample allowance for current and future taxation on ascertained profits. The company had acquired from the Government two factories which were built on its land during the war by the Ministry of Supply. With these additions, the factory space now available at their Cowley works was just under 50 acres under roof. The directors were not recommending a higher dividend. They had pursued a very conservative policy in the administration of their company and had ploughed back profits into the business amounting to about £2,000,000, as well as providing approximately £1.600,000 for depreciation and obsolescence, although the whole of the plant and buildings had been well maintained and were in excellent condition. This had enabled them to build and equip

new factories, to improve production methods by the purchase of the latest machinery, and to develop the company until it had become a very important industry, largely concerned in the export as well as the home trade of the country.

American-Built Electric Locomotives for Argentina.—The Argentine State Railways have accepted final designs for 65 electric locomotives which the General Electric Company, U.S.A., is constructing under an $18,000,000 contract. The locomotives are being built in three types to suit the unusual operating conditions in Argentina. The largest will be a twin-unit 2,000 h.p. engine, designed for use in the Andes. Another type of locomotive is for operation in the plains. Deliveries will begin next year.

Record Number of Tourists.—Tourist arrivals in Great Britain in June reached the record figure of 43,583. This is 3½ per cent. greater than the average for June over the record pre-war years 1936-1938. To the latest figure must be added the many Empire visitors for whom statistics are not yet available. Bearing in mind that June, though a popular month, is not at the peak of the tourist season, indications are that the Travel Association estimate of 500,000 visitors from overseas for the full year might well be exceeded.

U.S. Railway Earnings.—The net operating income of 132 Class 1 American railroads in June was $124,979,000—more than double the $61,249,000 reported for June, 1947. Estimated net income after interest and rentals was $94,000,000, which compared with $44,000,000 for June, 1947. In the first six months of 1948 the net operating income before interest and rentals totalled $410,900,000, against $373,800,000 in the corresponding period of 1947. Net income after interest and rentals was estimated at $259,000,000, an advance of $37,000,000 on the first half of last year.

Control of Hudson Bay Railway.—The Hudson Bay Railway has been placed under the jurisdiction of the Board of Transport Commissioners in the matters of operational requirements and general rulings of the board. The step conforms with representations which have been made on behalf of the population served by the railway. The railway has been substantially completed and is now in a position to conform with the operational requirements. The authority which brings it under the board also re-entrusts the Canadian National Railways with the management and operation of the railway —a trust previously held between 1923 and 1926 but withdrawn pending the completion of the works of construction.

Superheater Company Exports Increased.—During the past financial year, there was a further increase in tonnage output, and new records were set up, despite the fuel crisis in the early part of the year. At the recent annual meeting, Sir Alexander L. McColl, Chairman, said that their export business now was greater than their total business pre-war. Orders on hand again exceeded in volume and value the figures of any previous year, but, though they had the capacity at their works, they were hampered by shortage and intermittent supplies of materials. Exports for the first three months of 1948, however, showed an increase of more than 50 per cent. on the corresponding period last year. Trading profits, after current taxation, were up by £42,437 due to increased output, and there was also brought into the profit and loss account £9,000 transferred from taxation reserve but no longer required. The balance available was sufficient to declare a higher dividend than last year, but the directors were in sympathy with the present views as to the limitation of dividends. In spite of the shorter working week their employees had in many cases increased their output.

Institute of Transport Annual Dinner, 1949.—The next annual dinner of the Institute of Transport has been fixed for Friday, March 18, 1949.

Guiana and Honduras Development Plan.—A ten-year plan for the economic development of British Guiana and British Honduras with an expenditure of £20,000,000, is to be recommended by the Colonial Office Commission, Georgetown, British Guiana. The largest scheme proposed in the reported plan envisages spending about £10,000,000 in the development of huge timber resources in the River Essequibo area of British Guiana. The erection of processing factories, the development of Bartika as a port for deep-sea freighters, and the construction of either a logging railway or motor road are other features of the plan.

Switchgear & Cowans Limited.—The Chairman of Switchgear & Cowans Limited, Mr. H. Burroughes, stated at the recent annual general meeting that the company's policy of ploughing back a good proportion of earnings into the business had enabled them to re-equip their works completely with modern plant. They had been able to overcome some of the difficulties to which he had referred at their last meeting, with the result that the profit was £48,044 better than in 1946. The new rates of profits tax were an additional burden, but he felt that the hardest of all was the insufficiency of the wear and tear allowance to provide funds for renewal of equipment when necessary, due to the abnormal increase in equipment costs.

Southdown Motor Services Limited.—Addressing the annual meeting of the company recently, the Chairman, Mr. R. P. Beddow, said that the nationalisation of their industry, as a result of area schemes prepared under the powers given to the British Transport Commission, might well prove to be a disaster. Road passenger transport as at present organised was efficient and well-regulated. It had a long record of public service, and had achieved a very large measure of co-ordination. The public was still paying the same fares as were in operation at the time of the first world war, notwithstanding vastly increased costs of operation and standards of comfort. The Government's cut in fuel for private hire and excursion work had necessitated curtailment of the company's excursion programme just when more vehicles were available to meet it. This measure forced pleasure traffic between resorts on to the ordinary scheduled bus services, with consequent congestion, and without excursion travellers having the facility of booking seats. Even if the excursion coaches were used as reliefs on the regular routes, a manpower difficulty arose because they then required conductors, which was not the case when operating purely excursion journeys. Observing that the public might well be perturbed by the results of nationalisation in other spheres, Mr. Beddow recalled the new peak reached in the price of coal, the steady rising of fares and charges, and the increase of electricity costs in many areas by the British Electricity Authority on the day before the vesting date.

South African Coal for New Zealand Railways.—The New Zealand railways are to receive from the Transvaal 9,000 tons of coal a month to a total of 120,000 tons in the first instance. The order, which was arranged by the New Zealand representative in South Africa, will probably be extended because Transvaal coal is most suitable for the New Zealand railways.

Antofagasta (Chile) & Bolivia Railway.—After meeting interest for the full year on debenture stocks, paying 2½ per cent. on account of arrears of dividend on the 5 per cent. cumulative preference stock, and making provision for income tax, etc., the balance on net revenue account at December 31, 1947, including £418,597 brought in from the previous period, was £518,600, against £446,097, which included £407,009 brought in. It is proposed to pay a dividend of 5 per cent., being dividends payable in respect of the second half of 1937 and the first half of 1938 on the 5 per cent. accumulative preference stock, and to carry forward £463,600.

Salvador Railway Co. Ltd.—There was a profit on working for the year ended June 30, 1947, of £8,911, compared with £14,776 in the preceding year. Gross receipts increased from £127,885 to £133,342, but the balance of the revenue account decreased from £14,776 to £8,911 on account of higher expenses. Receipts from passenger traffic fell from £53,336 to £49,902, but freight, storage, and allied earnings rose from £74,155 to £82,772. After payment of interest, and providing for taxation and other charges, the final net balance showed a debit of £731, compared with one of £35,490 in the previous year. The final result after bringing in the debit from the preceding year is a deficit of £88,096.

Midland Uruguay Extension Railway Debenture Stock.—The directors of the Midland Uruguay Extension Railway announce that the trustee of the 5 per cent. debenture stock, in accordance with the power granted under the supplemental trust deed dated July 10, 1947, has extended the moratorium of interest on the stock to cover the instalments payable on May 1 and November 1, 1948. Under the scheme of arrangement submitted to, and approved by, the stockholders of the company on June 28, 1948, designed to give effect to the agreement for the sale of all the British-owned railways in Uruguay to the Uruguayan Government, the net proceeds therefrom available to the company were to be distributed among the holders of the 5 per cent. debenture stock, as soon as possible after receipt of the purchase price. To become effective, however, the scheme of arrangement had to be approved by a 75 per cent. majority of every class of stockholder party thereto, a condition which was not fulfilled in the case of the holders of the 5 per cent. second debenture stock of the Central Uruguay Railway. The directors of that company are endeavouring to find a solution to secure the requisite approval of the dissentients so that the sale agreement can be ratified by all stockholders. Thereafter the sale agreement has to be ratified by the legislative authority in Uruguay.

OFFICIAL NOTICES

None of the vacancies on this page relates to a man between the ages of 18 and 50, inclusive, or a woman between the ages of 18 and 40, inclusive, unless he, or she, is excepted from the provisions of the Control of Engagement Order, 1947, or the vacancy is for employment excepted from the provisions of that Order.

Crown Agents for the Colonies

APPLICATIONS from qualified candidates are invited for the following post:—

ACCOUNTANT required by the Government of the Gold Coast for the Railway Department for two tours of 18 to 24 months, with prospect of permanent and pensionable employment. Salary and overseas pay between £600 and £1,200 a year, according to age, experience, and war service. Outfit allowance £60. Free passages. Candidates, age 24 to 35 years, must hold book-keeping and final accounting certificates, be capable of taking charge of a section of a railway accounts office and instructing staff in new or amended simple accounting procedure. Experience in railway accounts, though preferred, is not essential. Apply at once by letter, stating age, whether married or single, and full particulars of qualifications and experience, and mentioning this paper, to the CROWN AGENTS FOR THE COLONIES, 4, Millbank, London, S.W.1, quoting M/N/17137 (3E) on both letter and envelope.

THE ALUMINIUM DEVELOPMENT ASSOCIATION invites applications for a senior appointment on its permanent staff of Railway Mechanical Engineer, with experience in the design of railway vehicles of all types. The successful applicant will be required to carry out development investigations on the application of aluminium and its alloys. Knowledge of light alloys, while not essential, is desirable, but facilities are available for close contact with the aluminium industry. Salary will be in accordance with the applicant's qualifications and experience. Applications, giving full details, should be forwarded to the Secretary of the Association at 33, Grosvenor Street, London, W.1.

OFFICIAL ADVERTISEMENTS intended for insertion on this page should be sent in as early in the week as possible. The latest time for receiving official advertisements for this page for the current week's issue is 9.30 a.m. on the preceding Monday. All advertisements should be addressed to:—*The Railway Gazette*, 33, Tothill Street, Westminster, London, S.W.1.

Australia

QUEENSLAND GOVERNMENT RAILWAYS

POSITIONS VACANT

APPLICATIONS will be received by the undersigned until September 8, 1948, from persons desiring to join the service of the Commissioner for Railways, Brisbane, Queensland, Australia, in the following capacities:—

Designing Civil Engineer (Present salary range £626 to £751, Australian currency, per annum).

Must hold Degree in Engineering from a recognised University or other equivalent qualification.

Must be capable of, and have had experience in, the preparation of drawings involving the design of and calculations for any civil engineering structures such as railway and roadway bridges in steel, reinforced concrete or timber, retaining walls, dams, drainage works, water supplies, etc.

Two Civil Engineering Draughtsmen (First Grade). (Present salary range £493 to £626, Australian currency, per annum).

Must hold Technical College Diploma in Civil Engineering or other equivalent qualification.

Must be capable of, and have had experience in, preparation of plans, details of specifications from sketches and instructions, also preparation of minor designs such as simple trusses and beams and standard drawings, also the preparation and taking out of ordinary working estimates and quantities.

Two Survey Draughtsmen (First grade). (Present salary range £493 to £626, Australian currency, per annum).

Must submit details of Technical College Diploma or other certificate of course of training in Survey Drafting.

Must be capable of, and have had experience in, preparation and completion of working plans and sections, compilation and checking of Surveyor's work, plotting and designing new station yards, permanent way drawings, etc., with all necessary calculations, quantities and descriptions connected therewith.

Appointment may be made at a commencing salary within range stated, according to qualifications and experience.

Particulars required to be furnished by applicants and conditions of employment will be supplied on application to the undersigned.

L. H. PIKE,
Agent-General for Queensland,
Australia,
409-410, Strand,
London, W.C.2

Crown Agents for the Colonies

APPLICATIONS from qualified candidates are invited for the following post:—

SENIOR DRAUGHTSMAN (ENGINEERING) required by the East African Railways and Harbours for 2 to 4 years, with prospect of permanency. Salary £500 a year, rising to £600 a year. Cost-of-living allowance up to £187 a year. Outfit allowance £30. Free passages and quarters. Superannuation fund. Candidates must have a sound knowledge of engineering works and building construction; and of the design of structural steel and reinforced structures. A knowledge of railway yard layout an advantage. Apply at once by letter, stating age, whether married or single, and full particulars of qualifications and experience, and mentioning this paper, to the CROWN AGENTS FOR THE COLONIES, 4, Millbank, London, S.W.1, quoting M/N/23736 (3D) on both letter and envelope.

ELECTRICAL/MECHANICAL Senior Draughtsman required. Some experience of railway traction and civil engineering work would be an added advantage. Westminster district. Salary £470 per annum minimum, but higher remuneration will be paid according to experience and capabilities. Write giving full particulars of experience and qualifications, age, etc., to MERZ & MCLELLAN, Milburn, Esher, Surrey.

INTERNATIONAL RAILWAY ASSOCIATIONS. Notes on the work of the various associations concerned with International traffic, principally on the European Continent. 2*s*. *By post* 2*s*. 2*d*.

RAILWAY SIGNALLING AND COMMUNICATIONS, INSTALLATION AND MAINTENANCE. A practical guide, especially intended to help Signal Inspectors, Installers, Fitters, Linemen, Draughtsmen, and all concerned with installing and maintaining Signal, Telegraph, and Telephone Equipment. 416 pp. Many illustrations. Cloth, 8*s*. *By post* 8*s*. 6*d*.

TRANSPORT ADMINISTRATION IN TROPICAL DEPENDENCIES. By George V. O. Bulkeley, C.B.E., M.I.Mech.E. With chapters on Finance, Accounting and Statistical Method. In collaboration with Ernest J. Smith, F.C.I.S., formerly Chief Accountant, Nigerian Government Railway. 190 pages Medium 8vo. Full cloth. *Price* 20*s*. *By post* 20*s*. 6*d*.

Roumanian Railways Nationalised.—A network of privately-owned Roumanian railways, nationalised by Act of Parliament on June 11, has been formally transferred to the State Railways.

Liverpool Overhead Traffics.—At August 1, aggregate receipts for the first seven months of the year, were £85,504, representing a decrease of £964 over last year. In the week ended August 1, traffics, at £3,060, fell by £125.

Rhodesia Railways Results.—The total receipts for April, 1948, were £691,420, an increase of £166,052 on the corresponding period last year. Total expenses were £509,053, leaving a net operating revenue of £182,367. These figures include the Vryburg-Bulawayo section, which the South African Railways operate, but not the Beira and Shabani Railways, private companies whose systems are worked by the Rhodesia Railways.

Model Engineer Exhibition.—The twenty-third Model Engineer Exhibition was opened at the New Royal Horticultural Hall, Westminster, on August 18, when Mr. Kenneth Garche paid tribute to the late Mr. Percival Marshall as the founder of the Exhibition. A very wide selection of model engineering exhibits combined with first class craftsmanship have become recognised features of the exhibition, and this year the already high standard has been more than maintained. Apart from the trade stands, there is a particularly fine range of locomotive models by private constructors, and among them may be mentioned a 1½-in. scale, 7¼-in. gauge L.M.S.R. Pacific by Mr. H. C. Powell, and Mr. H. J. Refoy's model of the old G.W.R. 2-4-0 *Isis* Another G.W.R. model is by Mr. F. Coltam, a ¾-in. scale "King" class 4-6-0, and Mr. W. D. Hollings exhibits a 1½-in. scale free lance 0-6-0 dock tank engine. Railway exhibits also include the work of model engineers in Holland, France, Denmark, Sweden, Canada and Switzerland, and a model passenger-carrying line is demonstrated.

Murex Limited.—The consolidated trading profits and interest of Murex Limited for the ten months to April 30 were £696,713 as compared with £432,346 for the previous year. The group net profit, after tax, was £250,509, against £170,947, while £125,831, against £129,784, was brought in, plus £32,499 surplus on the sale of shares in associated companies General reserve receives £183,000, against £62,500, and a final ordinary dividend of 10$\frac{5}{12}$ per cent. makes 16¾ per cent. for the period, which is equivalent to the 20 per cent. paid last year. There remains £126,759 to be carried forward.

Assam Railways & Trading Co. Ltd.—Speaking at the ordinary general meeting of the company on June 9, the Chairman, Colonel C. F. Birney, said that their gross trading profit was nearly £35,000 less than in the previous year. So far, the Government of India had declined to permit any increase in the selling price of their coal. The final result disclosed a balance of £31,991, to which was added £26,365 carried over from the previous year. The board considered it essential to add another £30,000 to the development reserve, which then would stand at £60,000. The price of their coal had been fixed by the Government of India in 1944. Representations for it to be raised were made early last year, but so far no increase had been sanctioned. They could no longer afford to go on producing briquettes from coal dust for sale at the present controlled price, and therefore had closed the plant for the time being. Their property lay wholly in the Dominion of India, but their communication with Calcutta, whether by rail or river, crossed and recrossed the frontiers of Pakistan. Transport was difficult and irregular, and the vexations and delays caused by customs regulations had a deadening effect on efficiency.

San Paulo Railway Capital Payment.—Payment of the San Paulo Railway's recognised capital of £6,639,000 plus interest, has been authorised by the Brazilian Government. Payment will be made from Brazilian credits in Britain and must be liquidated immediately with a view to avoiding further interest.

Railway Passenger Traffics.—In the table which accompanied an article on railway passenger statistics in our August 13 issue, the increase in passenger receipts to May 16 this year, compared with the like period 12 months earlier, on the London Transport system was shown as £2,780,000. This figure referred to all classes of passenger journeys on the London Transport system; the increase for railway passenger receipts was £638,000.

Progress of J. Stone & Co. Ltd.—Mr. K. H. Preston, Chairman & Managing Director, speaking at the annual meeting, said that total sales were 23 per cent. greater than in 1946. The order book, as at December 31, was about £2,000,000 greater than a year ago, and so far this year, orders received had exceeded sales. Early in 1947 the company purchased from Platt Brothers, its holding of 102,000 shares in the Stone Platt Engineering Co. Ltd. The products of this subsidiary

covered air-conditioning equipment for railway vehicles, moulding machines, fixed ratio gears, etc., and the air-conditioning equipment now made at Oldham included certain items which previously had to be purchased from the Carrier Corporation of America. Increases in sales had made manufacture in this country a commercial proposition. The net profit was £218,858, but if past practice had been adopted for the period under review, the charge for income-tax would have been reduced by the tax deductable on dividends payable, making the profit £303,953. This compares with £242,828 for 1946 when credit was taken for £220,000 excess profits tax recoverable. It has been decided to pay a final ordinary dividend of 15 per cent., which, with the interim dividend already paid, makes 25 per cent. for the year, leaving £410,896 to be carried forward.

New Zealand Railways Operating Loss.—The New Zealand Railways showed an operating loss of £1,125,811 for the year ended March 31, 1948. Total operating expenditure amounted to £15,090,091 and revenue to £13,964,280.

New Roumanian Allocation for Railways.—The Roumanian State Planning Commission has allocated the sum of 12,591,000,000 lei for future capital investment. The funds will be used for oil drilling, reconstruction of oil refineries, and equipment of the State railways.

Belgium-Luxembourg and Bizonia Trade Agreement.—An 80 million dollar exchange agreement between the Belgian Luxembourg Customs Union and the Anglo-American Bizone was signed in Brussels recently. The Bizone will send to Belgium and Luxembourg more than 75 million dollars worth of coal, machine-made goods and cars, receiving in return, 84 million dollars worth of railway wagons, phosphates and raw materials.

Bendix Radio Equipment.—A wide range of Bendix Radio Equipment, which includes mobile, ground, and aircraft radio communication systems, and navigational aids, is to be produced under licence by the Plessey Co. Ltd., Ilford, which recently has concluded patent arrangements with the Bendix Corporation of America for the manufacture and sale of its equipment. Equipment produced will be interchangeable with Bendix installations already in use in Great Britain.

Strike Cuts Eastern Region Suburban Services—About 100 coalmen, tube cleaners, boiler washers, and depot shunters at Stratford (London) locomotive depot, began an unofficial strike on August 16. As a result, suburban train services into and out of Liverpool Street Station were cut by about 20 per cent. on the morning of August 17. On that day a meeting between Eastern Region officials and N.U.R. headquarters, arranged before the stoppage took place, was held to discuss the matter at issue, which concerned conditions of employment. The dispute was settled the same evening, and normal suburban services were resumed the next day.

Forthcoming Meetings

August 18-28.—The Model Engineer Exhibition at the New Royal Horticultural Hall, Westminster. Open from 11 a.m. to 9 p.m.

August 26-September 11.—Machine Tool & Engineering Exhibition at Olympia.

Railway Stock Market

Numerous factors again have combined to keep Stock Exchange business at a minimum. Earlier in the week, dealers were awaiting full details of the big Imperial Chemical issue which will raise over £20,000,000, while, generally, buyers were holding off all markets pending news of the outcome of the Moscow talks.

With caution the keynote of markets, buying has centred mainly on British Funds, which moved narrowly, but kept a firm undertone. Yield considerations tended to attract buyers to British Transport 3 per cent. stock (1978-88), which at 98 has remained at its best level since dealings commenced in January, when the price went to a discount of 2¼ in initial business. Transport 3 per cent. (1967-72) strengthened to 99¾ and Transport 3 per cent. (1968-73) at 101 has kept ¼ below 3 per cent. Electricity stock. The market is now inclined to the view that the big Transport stock (1978-88) may well touch par before the end of the year.

Brazil rails have been somewhat more active, although San Paulo eased slightly to 163, despite latest news from Brazil raising hopes that the company will receive during the next few weeks the £6,639,000 in respect of recognised capital *plus* interest. The question of the full value of the ordinary stock must depend on the outcome of the company's compensation claim in respect of "unrecognised" capital; and negotiations would probably take a long time to complete.

Elsewhere, Leopoldina ordinary firmed up to 10¼, the preference stock to 30½, while the debentures were 61 with Leopoldina Terminal debentures 55½. Great Western of Brazil shares have been more active around 82s. Elsewhere, B.A. Central stocks have been more active, the 4½ per cent. first debentures changing hands around 46, the 5 per cent. second debentures at 22½, and the 10-year notes around 20. In the absence of any further news as to a new or revised pay-out scheme, Uruguay rail stocks were uncertain, with Central Uruguay ordinary 8½ and the second debentures 76½. Antofagasta eased to 10½, but the preference stock was steady at 66. Beira Railway bearer shares turned easier, the price coming back to 60s. Manila Railway "A" debentures were 88 and the preference shares 9s. Elsewhere, Nitrate Rails eased to 72s. 6d. and United of Havana 1906 debentures were 15. After an earlier rise, French Railway sterling bonds receded, Midi and Orleans being 90½.

Despite the unchanged interim dividend, Canadian Pacifics have receded to slightly below 23, it being realised that unless the further request for higher freight rates is granted, it might be that no final dividend will be possible.

Road Transport shares again eased slightly, but there was little selling, and in many cases buyers found shares of the operating companies difficult to obtain. McNamara came back to 32s. on the outcome of the negotiations with British Transport, whose offer to purchase, which has been accepted, will mean approximately 33s. per 12s. unit available for distribution to stockholders. This is well below optimistic estimates current in the market, which recently ranged up to 40s. Tillings have come back to 97s. but National Omnibus were wanted and rose sharply to 76s. 9d. Iron and steels remained a steady section. If a Bill for nationalisation of iron and steel producers is introduced in the autumn, it should reveal the method by which the Government intends to provide compensation, or whether, as has been suggested, it is intended to purchase shares in the market to obtain control. Among shares of locomotive building, engineering and allied companies, Beyer Peacock marked 21s. 3d., Vulcan Foundry 27s. 9d., and Charles Roberts were firm at £7⅛.

Traffic Table of Overseas and Foreign Railways

	Railways	Miles open	Week ended	Traffics for week: Total this year	Traffics for week: Inc. or dec. compared with 1946/47	No. of week	Aggregate traffics to date: Total 1947/8	Aggregate traffics to date: Increase or decrease
				£	£		£	£
South & Central America	Antofagasta	834	8.8.48	29,280	— 10,670	32	1,659,010	+ 363,800
	Bolivar	174	June, 1948	$43,616	— $66,369	26	$442,327	— $232,536
	Brazil	—	—	—	—	—	—	—
	Cent. Uruguay ...	970	7.8.48	30,118	+ 2,495	5	175,833	— 14,485
	Costa Rica	262	June, 1948	35,195	+ 1,067	52	384,838	+ 27,962
	Dorada	70	Mar., 1948	19,700	— 9,500	13	59,500	— 30,000
	G.W. of Brazil ...	1,030	7.8.48	26,500	— 1,200	31	1,027,800	+ 13,400
	Inter. Ctl. Amer. ...	794	June, 1948	$1,068,881	+ $66,817	26	$7,066,133	+ $163,290
	La Guaira	22¾	July, 1948	$101,265	+ $487	30	$741,558	— $43,602
	Leopoldina	1,918	7.8.48	59,241	— 13,250	31	1,701,092	— 374,261
	Midland Uruguay ...	319	June, 1948	23,203	+ 5,169	52	233,269	+ 28,135
	Nitrate	382	31.7.48	17,392	+ 8,537	30	174,563	+ 39,508
	N.W. of Uruguay ...	113	June, 1948	4,183	— 1,664	52	65,784	— 3,243
	Paraguay Cent. ...	274	7.8.48	G98,852	+ G65,265	5	G548,982	+ G260,314
	Peru Corp. ...	1,059	July, 1948	178,942	+ 16,252	4	178,942	+ 16,252
	Salvador	100	May, 1948	c103,000	— c22,000	48	c1,899,600	+ c291,600
	San Paulo	153½	—	—	—	—	—	—
	Taltal	156	July, 1948	10,010	+ 4,425	4	10,010	+ 4,425
	United of Havana ...	1,301	7.8.48	40,142	— 30,157	5	254,263	— 109,719
	Uruguay Northern	73	June, 1948	1,771	+ 432	52	15,802	— 1,763
Canada	Canadian National ...	23,535	June, 1948	9,927,000	+ 564,000	26	57,166,000	+ 4,055,750
	Canadian Pacific ...	17,037	June, 1948	6,886,500	+ 270,250	26	40,207,500	+ 2,501,250
Various	Barsi Light† ...	202	July, 1948	33,300	— 795	17	114,007	— 322
	Beira	204	May., 1948	119,592	+ 14,234	34	936,254	+ 206,790
	Egyptian Delta ...	607	10.7.48	17,470	+ 929	14	178,422	+ 15,399
	Gold Coast ...	536	June, 1948	207,376	+ 67,243	13	665,638	+ 189,875
	Manila	—	—	—	—	—	—	—
	Mid. of W. Australia	277	June, 1948	26,319	+ 8,295	52	294,752	+ 80,772
	Nigeria	1,900	June., 1948	403,138	+ 91,614	13	1,292,292	+ 249,560
	Rhodesia	2,445	Sept., 1947	643,980	+ 102,833	52	6,787,603	+ 612,998
	South African ...	13,323	17.7.48	1,346,450	+ 125,699	15	20,361,231	+ 1,146,638
	Victoria	4,774	Apr., 1948	1,388,846	+ 615,854	43	—	—

† Receipts are calculated @ 1s. 6d. to the rupee